

BANKS PANEL MULT.

Ed Fox

Parkway 2



DWG NO.	CKT	DESCRIPTION			
100	MISC	CIRCUIT SYMBOLS	150	MISC	DIAL SUBSET
101	LF	TRIP MAG OPER.	151	"	SEQ. SW.
102		HUNT LEAD	152	MISC	CIRCUIT SYMBOLS
103		TRIP CKT CHAIN (A)	153	LF	FUND. CKT.
104		" " " (B)	154		GRP. DIST. CKT.
105		MB CHAIN CKT (A)	155		FUND. LF DIST.
106		" " " (B)	156		FUND. ST. CKT. TRANS.
107		TRANSFER (A)	157		SEL. DIST & CHAIN
108		" (B)	158	To	} SENDER CKT.
109		[K] RELEASE CKT (B)	160	-	
110		" " " (A)	161	DIST	FUND. DIST. TRK. HTG.
111		BANK ALARM	162	INC.	INC. BR-GRP+ FINAL SEL.
112		TT ALARM	163	FIN	PBX TRK HTG.
113	LF	ST. CKT ALARM	164		RING 2 PTY LINE
			165		1-2 BELL RINGING
			167	-	SDR
			168	MISC	PANEL COMM.
117	To	} OLD SENDER CKTS.	169	-	SDR.
131	-		170	FIN	PBX RELAY
			171		FINAL SEL. BB. TST
			173		PICTURE OF A CALL THRU EQUIP.
133	MISC	MESSAGE REG.	174	LF	LINK CKT. RELATION
134	MISC	DUPLEX MOTOR	175	INC	TRK MULT BANK NO.
135	PWR	RING. & COIN GEN.	177	LF	ARR. OF SEL.
136	LF	TIME ALARM	179	MISC	2 PTY MESS. REG.
141	-	} SENDER CKT. (OBS.)	180	-	SDR
142	-				
147	MISC	3SD TEST SET CKT.			
149	INC.	INC. TRK MULT.			

					300-399 PANEL LINK
182	MISC	MULT. BR. ADJ.	300	LINK	BANK PREF. LF-DIST
			301	LINK	FIND. DIST.
184	MISC	200 TYPE SEL ADJ.	302	LINK	ALLOT. OF LINKS
185		SEQ. SW PARTS	303	LINK	ST. CKT. TRANS.
186		3D COMM ADJ	304	FIN	TEST CUST. LINE
187		207 TYPE RELAY ADJ	305	FIN	SLEEVE FEATURES
188		'B' TYPE RELAY ADJ.	309	LINK	'T' RELAY "
189		HEL. SPR. CLUTCH ADJ.	313	LINK	FRONT OF LINK FR.
190		178 TYPE RELAY ADJ.			
191		E, F, H, R, T " "	400	FIN	SEL. CKT.
192		SEQ. SW. ADJ.	402	INC	KI INC.
			403	INC	FM "



BANKS

PANEL MULTIPLE TYPES

1. GENERAL

- 1.01 This section covers panel multiple banks (1, 2, 3, 4, 5, 6, 7, 8, 9, 15, 16, 17, 18 and 28 types).
- 1.02 This section is reissued to add information for identifying banks with silver terminals, to revise the requirement covering cleaning and treating of bank terminals, to delete the cleaning procedures and to amplify the procedures covering vertical and horizontal position of guide combs. Detailed reasons for reissue will be found at the end of the section.
- 1.03 Reference shall be made to Section A400.001 covering General Requirements and Definitions for additional information necessary for the proper application of the requirements listed herein.
- 1.04 Reference Terminals: All the terminals in the same circuit group as the nickel dipped reference terminal are known as reference terminals.
- 1.05 The requirements for the positioning of contact terminals shall apply for a distance of 13/64" measured from the tip of the terminal in toward the base.
- 1.06 Due precautions should be taken in using metal gauges or tools to check or adjust bank terminals connected to working equipment, to prevent serious circuit reactions due to bridging the terminals.
- 1.07 Theoretically correct dimensions for terminal spacing are shown on the figures as an aid in checking and adjusting the terminals to the requirements specified herein.
- 1.08 Reference herein to 100 point banks applies to the 1, 2, 4A, 4D, 5A, 5D, 9, 15E, 16 and 17 type banks.
- 1.09 Banks with Silver Terminals: A red stripe on the upper mounting bar of the bank above the soldering terminals indicates that the bank has silver plated tip and ring terminals. Under no circumstances abrade the tip and ring terminals of banks so designated.
- 1.10 Make Busy Information: Before making any of the inspections or readjustments covered by this section, make busy the circuits associated with the elevator apparatus in the approved manner. Do not start to clean or treat terminals until the brush rods associated with the terminals or the adjacent terminals have restored to normal.

2. REQUIREMENTS

2.01 Cleaning and Treating Bank Terminals

(a) Cleaning

(1) Brass Bank Terminals: Brass bank terminals shall be abrasively cleaned in accordance with the procedures covered in Section A503.638.

(2) Silver Bank Terminals: Silver bank terminals which are not to be treated with contact protectant receive a combined cleaning and treating procedure as covered under (b).

Caution: No abrasive cleaning shall be done on the contact edges of silver plated terminals of any bank.

(b) Treating

(1) Where Contact Protectant is not to be applied to Brass Terminals - No treatment.

(2) Where Contact Protectant is not to be applied to Silver Terminals - Oil treat the tip and ring terminals as covered in Section A503.638.

(3) Where Contact Protectant is to be applied to Brass and Silver Terminals - Treat the tip and ring terminals as outlined in Section A503.639.

Note: Contact protectant should not be applied to the sleeve or sleeve and hunt terminals.

(4) Brass tip and ring terminals shall be treated with contact protectant by the installer only at the request of the Telephone Company.

(c) Recommended Interval of Treating

(1) Oil Treating: Silver bank terminals oil treated as outlined in Section A503.638 should not require treatment more frequently than at yearly intervals.

(2) Retreating With Contact Protectant: The contact protectant applied to brass and silver tip and ring terminals shall be removed, the associated parts cleaned and the terminals retreated as covered in Section A503.639, at periodic intervals. Unless



indicated otherwise by contact noise measurements or record of open contacts, the treatment should ordinarily be effective for 24-30 months. In no case should the 30 month interval be exceeded as this represents the effective life of the treatment regardless of the contact noise levels or contact open indices.

## 2.02 Vertical Spacing of Terminals with Respect to Reference Terminals -

Fig. 1 (A), 2 (A) and 3 (A) - Any deviation of a tip, ring, sleeve or hunting terminal in any vertical row from its theoretically correct location with respect to its reference terminal shall not exceed:

- (a) 100 Point Banks - .015"  
Use the No. 116A gauge.
- (b) All Other Banks - .0085"  
Gauge by eye.

## 2.03 Vertical Spacing of Terminals with Respect to Adjacent Terminals (Except 3, 8 and 28 Type Banks) -

Figs. 1 (B) and 3 (B) - The distance between the top edge of each contact terminal and the bottom edge of the terminal next above it in the same vertical row shall be:

Min. .095"  
Gauge by eye.

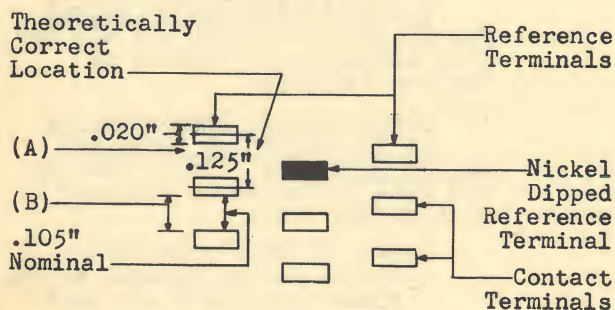


Fig. 1 - 1, 2, 4, 5, 7, 9, 15, 16, 17 and 18 Type Banks

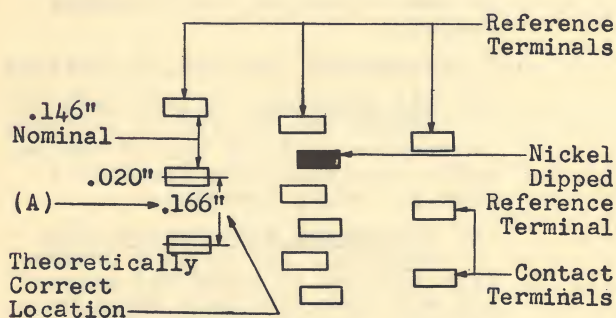


Fig. 2 - 3, 8 and 28 Type Banks

Theoretically  
Correct  
Location

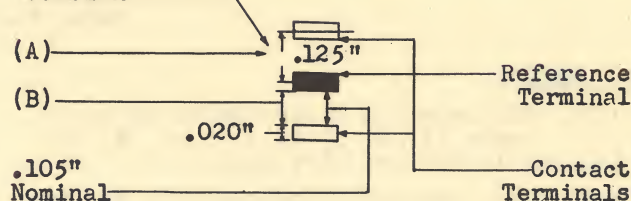


Fig. 3 - 6 Type Banks

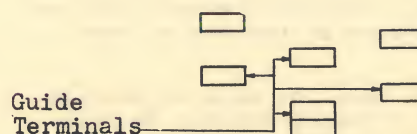


Fig. 4 - Nos. 4D, E, F, 5D, E, F and 15, 16 and 17 Type Banks

2.04 Soldering Terminals: No soldering terminal shall be broken to the extent that a satisfactory soldering connection is not assured.

2.05 Contact Terminals: No contact terminal shall be broken.

2.06 Horizontal Position of Guide Combs (Except Nos. 4D, E, F, 5D, E, F and the 6, 15, 16 and 17 Type Banks)

(a) Guide Combs Equipped with Tip and Ring Guides - Figs. 5(A) and 6(A): The contact edges of the bottom terminals in any vertical row and the corresponding edges of the associated guides shall not be out of alignment more than .016". Gauge by eye.

(b) Guide Combs Not Equipped with Tip and Ring Guides - 3 Terminals in a Group - Fig. 7(A): The contact edges of the bottom sleeve terminals of the bank and the corresponding edges of the associated guide shall not be out of alignment more than .020". Gauge by eye. As an aid in judging this dimension the thickness of the bank terminal, .020", may be used as a reference.

(c) Guide Combs Not Equipped with Tip and Ring Guides - 4 Terminals in a Group - Fig. 8(A): The right edge of the lowest bank terminal and the left edge of the next to the lowest bank terminal of the center row of terminals



and the corresponding edges of the associated guide shall not be out of alignment more than .020". Gauge by eye. As an aid in judging this dimension the thickness of the bank terminal, .020", may be used as a reference

2.07 Vertical Position of Guide Combs  
(Except for No. 4D, E, F, 5D, E, F and the 6, 15, 16 and 17 Type Banks)

(a) Guide Combs Equipped with Tip and Ring Guides - Figs. 5(B) and 6(B):

The vertical distance between the underside of the bottom terminal in each vertical row and the top of the associated guide shall be

Min. .105"  
Gauge by eye.

(b) Figs. 5(C) and 6(C): The vertical distance between the underside of the bottom terminal in each vertical row of sleeve terminals and the top of the associated guide shall be

Max. .125"  
Gauge by eye.

(c) Guide Combs Not Equipped with Tip and Ring Guides - Figs. 7(B) and 8(B):

The vertical distance between the underside of the sleeve terminal and the top of the associated guide shall be

Min. .105"  
Max. .125"

Use the R-2310 gauge, detail 2.

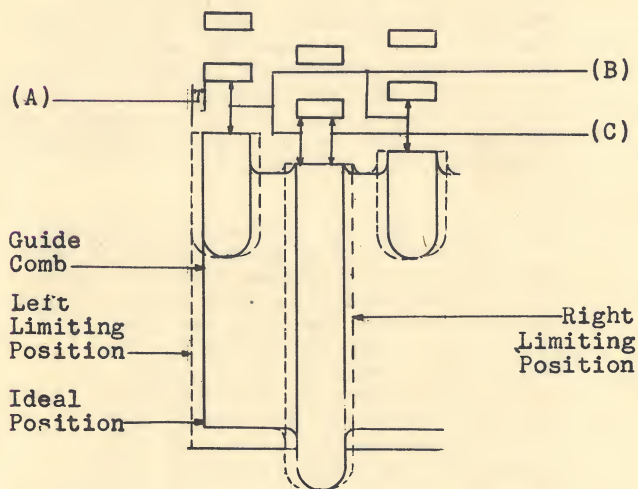


Fig. 5 - Nos. 4A, B, C, 5A, B, C, and 1, 2, 7, 9 and 18 Type Banks

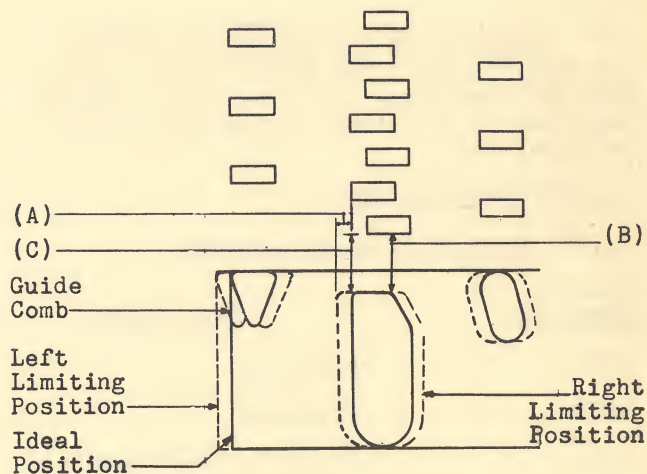


Fig. 6 - 3, 8 and 28 Type Banks

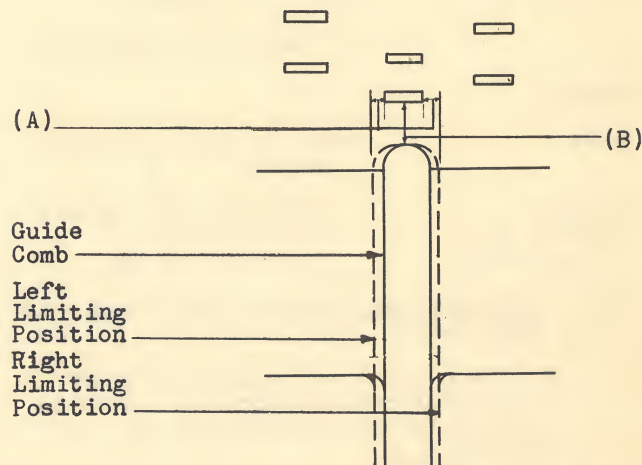


Fig. 7 - Nos. 4A, B, C, 5A, B, C and 1, 2, 7, 9 and 18 Type Banks

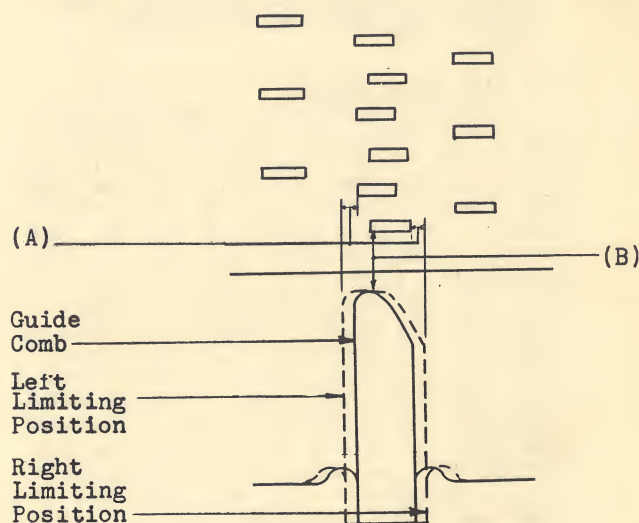


Fig. 8 - Nos. 3, 8 and 28 Type Banks



2.08 Front to Rear Position of Guides - Guide Combs Not Equipped with Tip and Ring Guides: The front to rear position of each guide shall be approximately parallel to the frame of the guide comb. Gauge by eye.

### 3. ADJUSTING PROCEDURES

#### 3.001 List of Tools and Gauges

<u>Code or Spec. No.</u>	<u>Description</u>
273	Adjuster
325B	Adjuster
432B	Multiple Bank Terminal Adjuster
R-6770	Special Screwdriver
-	4" Regular Screwdriver

#### Gauges

116A	Bank Terminal Locating Gauge
R-2310 (Detail 2) (2 Required)	.105" and .125" Double End Nonmetallic Thickness Gauge

#### 3.01 Cleaning and Treating Bank Terminals (Rq. 2.01)

(1) Clean and treat brass and silver terminals and associated parts as outlined in Section A503.638 or A503.639.

#### 3.02 Vertical Spacing of Terminals with Respect to Reference Terminals (Rq. 2.02)

#### 3.03 Vertical Spacing of Terminals with Respect to Adjacent Terminals (Rq. 2.03)

(1) 100 Point Banks: To check the vertical spacing of terminals on 100 point banks, proceed as follows: Place the No. 116A gauge in the vertical space between the rows of the tip and sleeve terminals or the ring and sleeve terminals depending on the terminals to be checked. See Fig. 9. Then engage the guide pins of the gauge with the reference terminal of the vertical row being checked as shown in Fig. 10. Then remove the hand from the handle of the gauge. Do this so that the gauge will not be moved while checking the terminals. When checking the spacing of the terminals, the eye should be on a level with the terminal being engaged. It is not intended that the extra terminals on No. 15E and 16 and 17 type banks which serve as guides as shown in Fig. 4, be checked

with the gauge except the sleeve terminal immediately below the No. 0 terminal on No. 15E banks. If the multiple brush in the normal position on banks on which the brushes are permanently tripped, interferes with the placing of the gauge on the bank, lower the down-stop collar in accordance with the Division A400 section covering the elevator apparatus involved. Take care that the down-stop collar is properly located after the gauging operation.

(2) If the gauging operation indicates that the end of any terminal projects above or below the corresponding white mark on the gauge, place the No. 432B adjuster over the terminal at fault as far back as possible and adjust it up or down as required. However, if there is a general misalignment of terminals, refer the matter to the supervisor.

(3) Take care when realigning bent terminals to adjust to the mean so that 2.03 covering minimum spacing between adjacent terminals is met. This will insure that the readjusted terminals will be satisfactorily positioned.

(4) Other than 100 Point Banks: To check the vertical spacing of terminals which have been bent on these banks, gauge the location of the terminal under consideration by comparing it with the location of adjacent terminals in the same vertical row. If any terminal is bent, adjust as outlined in (2). To check the spacing of terminals which may be displaced for other reasons make use of the tripped associated multiple brush as a means of determining the location of the terminals. If the terminals are not within the requirements refer the matter to the supervisor.

(5) Check the top, middle and bottom terminals of a group by means of the tripped associated multiple brush. When these terminals have been properly positioned, they may be used as guides for properly locating the remaining terminals in a group. If a bank is served by two multiple brushes, that is, the lower half of the bank by one brush and the upper half by another brush, check the top, middle and bottom terminals of each half with their associated multiple banks.

#### 3.04 Soldering Terminals (Rq. 2.04)

#### 3.05 Contact Terminals (Rq. 2.05)

(No procedures)



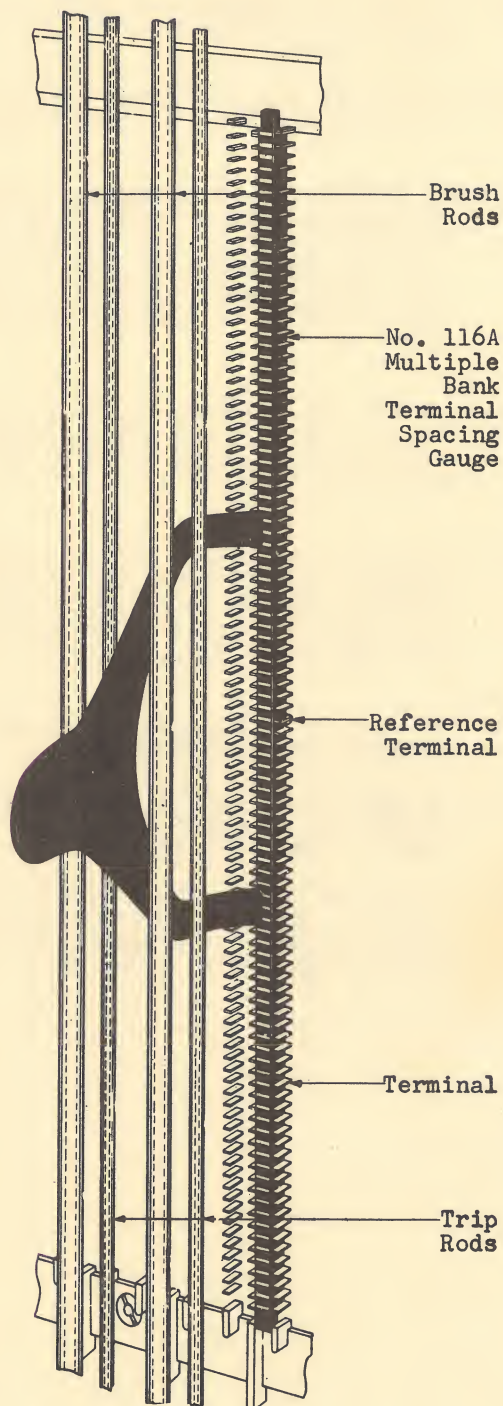


Fig. 9 - Method of Placing No. 116A Multiple Bank Terminal Spacing Gauge Between Vertical Rows of Terminals

- 3.06 Horizontal Position of Guide Combs  
(Except Nos. 4D, E, F, 5D, E, F and the 6, 15, 16 and 17 Type Banks)  
(Rq. 2.06)
- 3.07 Vertical Position of Guide Combs  
(Except Nos. 4D, E, F, 5D, E, F and the 6, 15, 16 and 17 Type Banks)  
(Rq. 2.07)

(1) Guide Combs Equipped with Tip and Ring Guides: If the position of the guide comb is not satisfactory, slightly loosen the guide comb mounting screws with the 4" regular screwdriver while holding the nuts with the R-6770 screwdriver and shift the guide comb as required. Only loosen the mounting screws enough to permit the guide combs to be relocated. In making this adjustment take care not to destroy the adjustment of the guide comb on the other side of the bank as both guide combs are held in place by the same mounting screws. After the guide comb has been satisfactorily adjusted securely tighten the mounting screws. This procedure is a two man operation.

(2) Guide Combs Not Equipped with Tip and Ring Guides: Slightly loosen the guide combs as outlined in (1) and position the guide combs visually so that as many as possible of the guides are centered horizontally with respect to the associated vertical rows of terminals. Insert the .105" end of one of the R-2310 gauges between the sleeve terminal at the end of each of

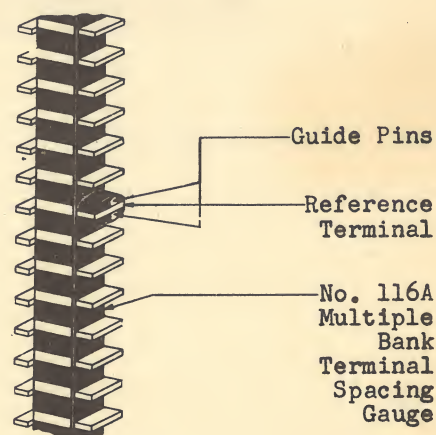


Fig. 10 - Method of Placing Guide Pins of No. 116A Multiple Bank Terminal Spacing Gauge On Reference Terminal



the associated guide combs on opposite sides of the bank and the associated guide comb prong. Then press each guide comb up against the gauge and tighten the screw sufficiently to retain this adjustment. Repeat this procedure on the opposite end of the guide comb. Recheck both ends of the guide combs. If the guide comb cannot be positioned so that all the guides are positioned properly, raise the associated brush rods high enough to provide access to the guide comb. In the case of the lowest guide comb, it may be necessary to remove the rack and block the brush rod in the raised position. Then if necessary adjust the individual guides with the narrow slotted end of the No. 273 adjuster. Exercise care not to nick the guide or allow the adjuster to come into contact with the bank terminals. Remount the rack and restore the brush rod to normal.

3.08 Front to Rear Vertical Position of Guides - Guide Combs Not Equipped with Tip and Ring Guides (Rq. 2.08)

(1) To adjust the guide with respect to its front to rear vertical position, use the offset end of the No. 325B adjuster. Place the adjuster on the guide from the left side.

Caution: Take care when adjusting a guide that the adjustment does not throw it out of parallelism with the guide comb to such an extent that the contacting surfaces of the associated brush fail to coincide with the edges of the guide.

REASON FOR REISSUE

1. To add information for identifying banks with silver tip and ring terminals (1.09).
2. To revise the requirement covering cleaning and treating bank terminals.
3. To revise the requirements covering horizontal and vertical positions of the guide combs to cover guide combs that are not equipped with tip and ring guides (2.06 and 2.07). (Previously covered in Addendum A445.002, Issue 5B.)
4. To add the requirement for the front to rear position of guides (2.08). (Previously covered in Addendum A445.002, Issue 5B.)
5. To revise the "List of Tools and Gauges", to add tools and gauges for checking and adjusting guide combs and to delete the tools and materials for cleaning guide combs (3.001).
6. To delete the procedures for abrasively cleaning brass terminals.
7. To amplify the procedures covering horizontal and vertical position of guide combs (3.06 and 3.07).
8. To add an adjustment procedure for the front to rear vertical position of guides (3.08). (Previously covered in Addendum A445.002, Issue 5B.)

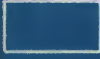






Bell Telephone Laboratories, Inc.



# MAGNETS - RELAYS - DESIGNATE RELAY INVOLVED

-  OPERATED
-  OPERATED & LOCKED
-  SLOW OPERATING
-  PREVIOUSLY OPERATED - LOCKS
-  PREVIOUSLY OPERATED - HOLDS
-  OPERATED & RELEASED
-  RELEASED
-  SLOW RELEASING
-  RELAY SHUNTED
-  RELAY OPERATED - HOLDS
-  MARGINAL - CIRCLE RELAY DESIGNATION
-  POLARIZED RELAY

## MAGNETS

-  OPERATED
-  RELEASED
-  OPERATES & RELEASES
-  COMMUTATOR SEGMENT
-  OPERATES & LOCKS
-  PREVIOUSLY OPERATED - LOCKS
-  PREVIOUSLY OPERATED - HOLDS

THE PACIFIC TEL. & TEL. CO PLANT TRAINING		DWG. No. PT 100	
		DRAFTSM JER	12-5-47
SYMBOLS FOR CIRCUIT DEVELOPMENT		ORIGINAL DV	ISSUE No. 1
		APPROVED	



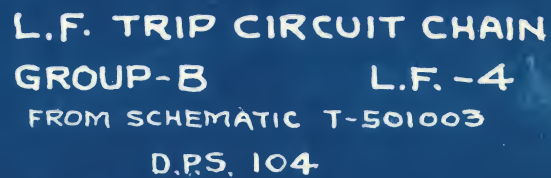




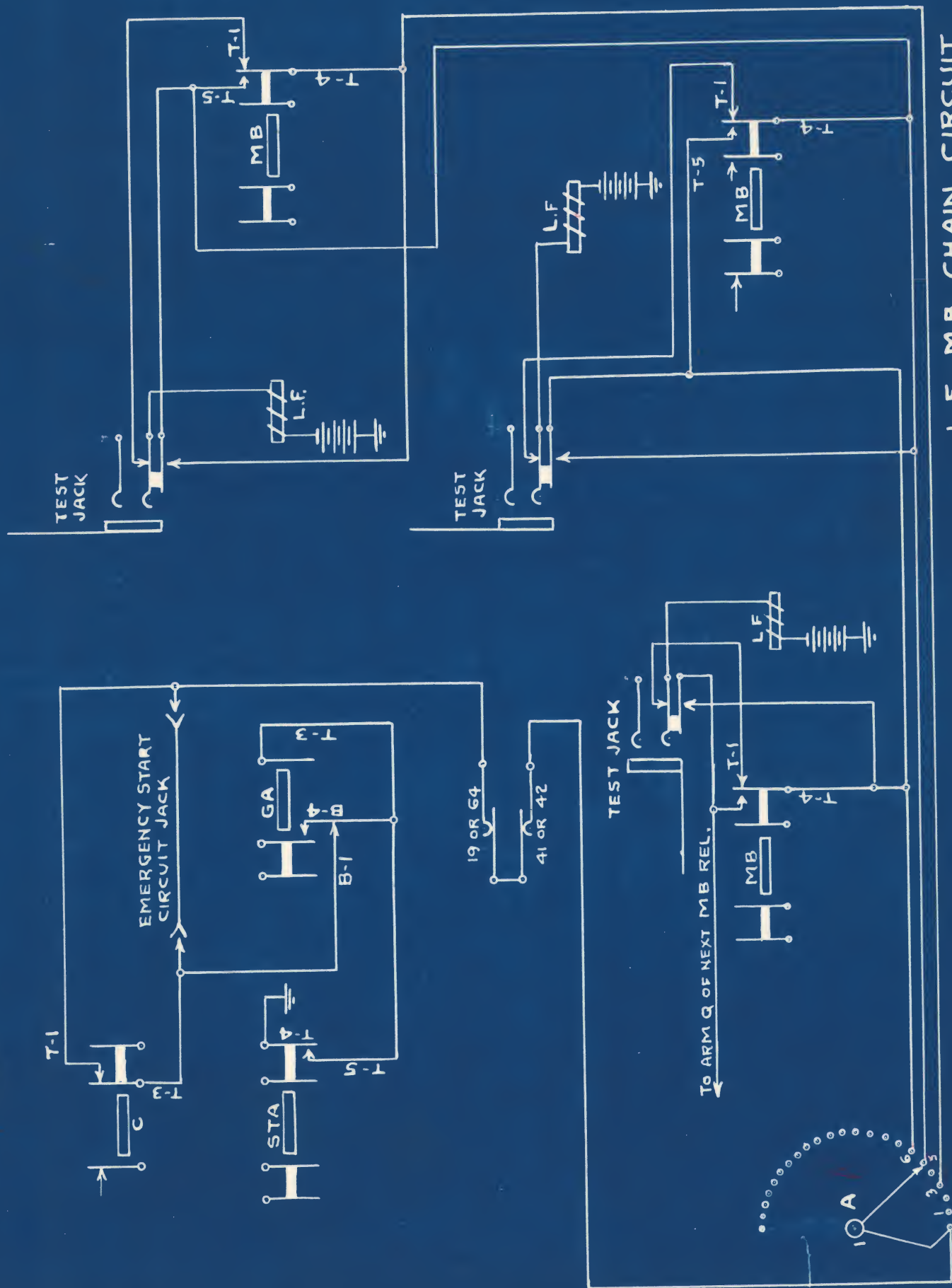






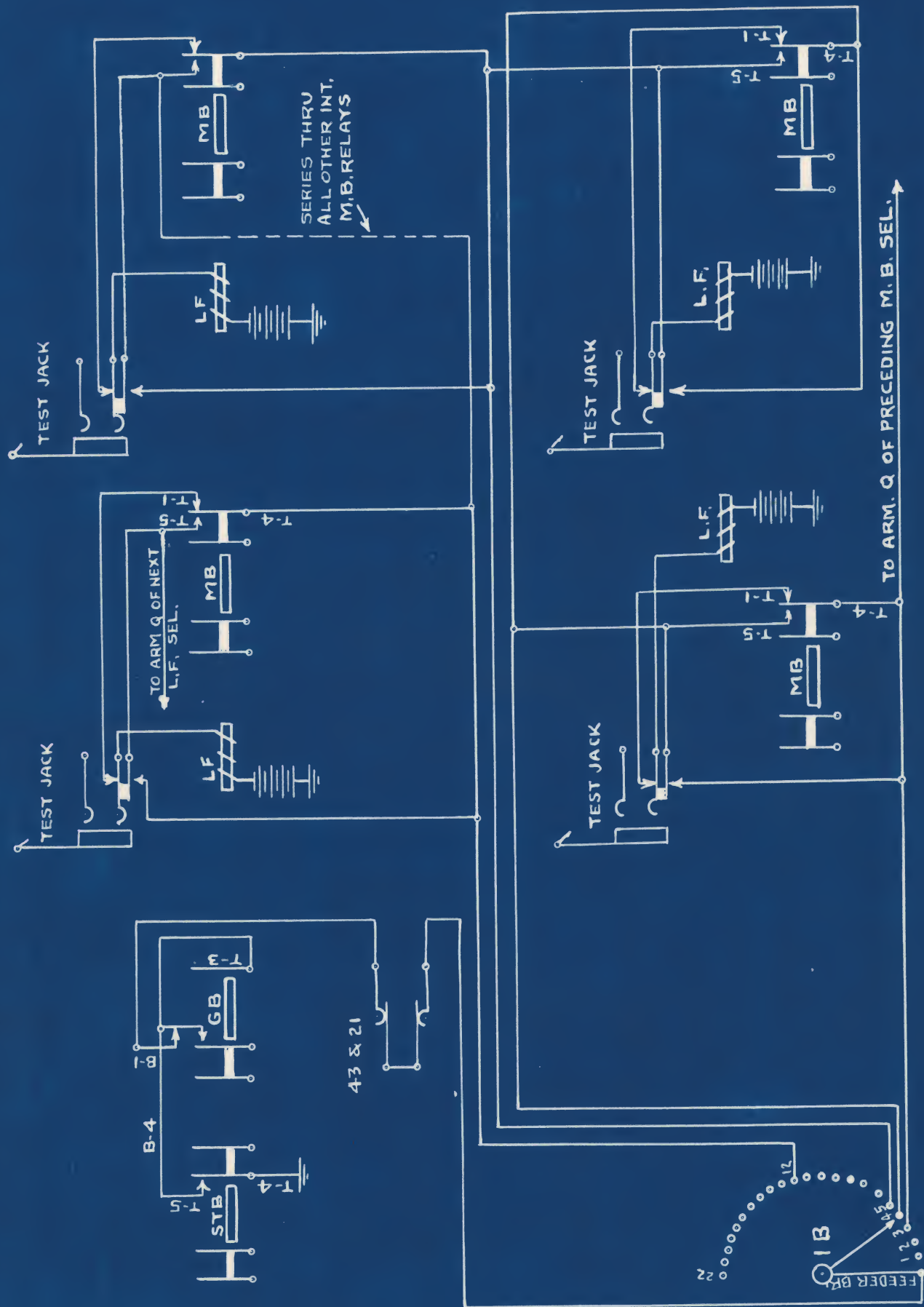






L.F. M.B. CHAIN CIRCUIT  
ALLOTMENT OF SELECTORS  
IN "A" SUB. GROUP - L.F.5  
FROM SCHEMATIC T-501003  
D.P.S. 105





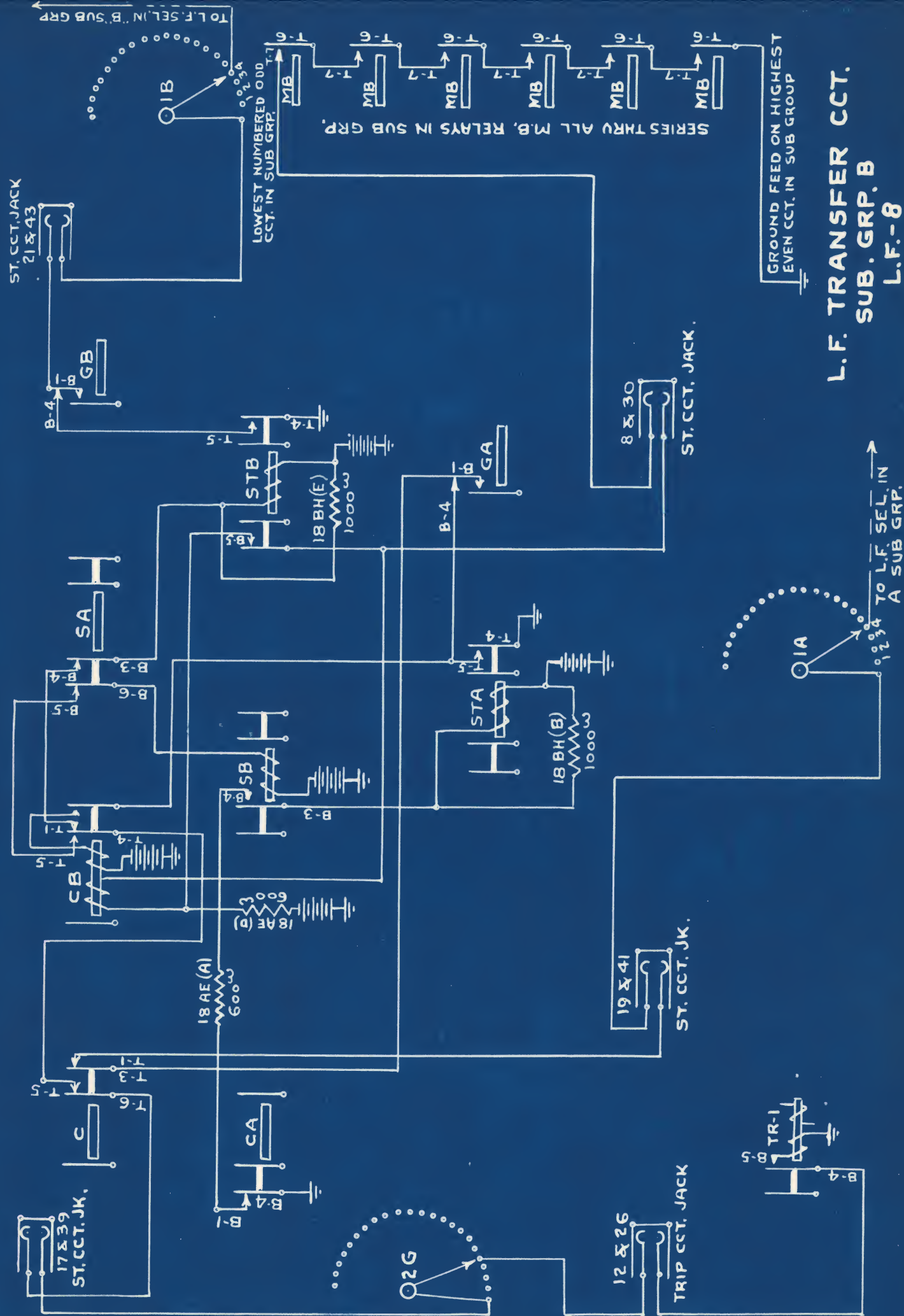
L.F. M.B. CHAIN CIRCUIT  
ALLOTMENT OF SELECTORS  
IN "B" SUB GROUP - L.F.- 6

FROM SCHEMATIC T-501003  
DPS 106  
REC-415









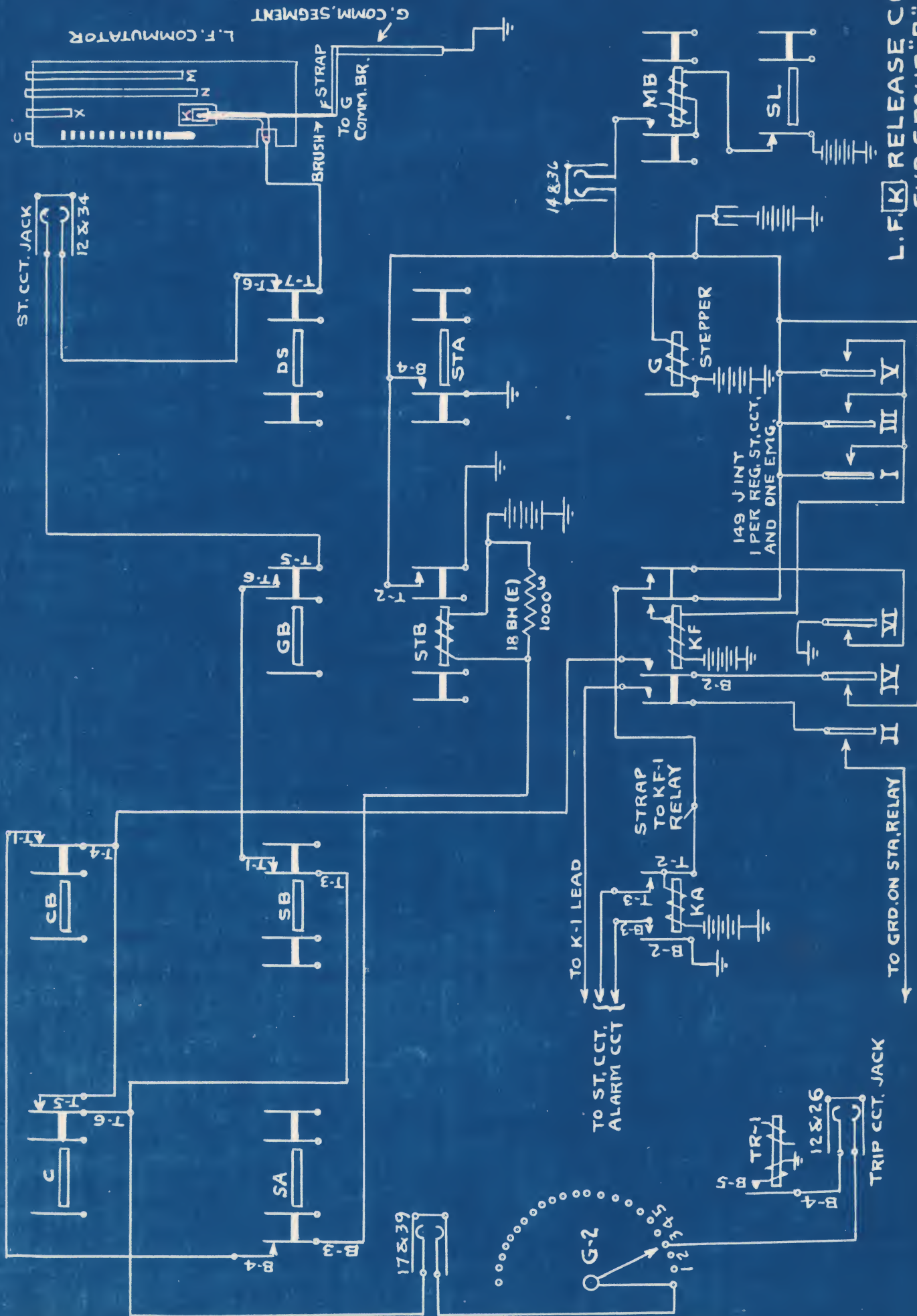
L.F. TRANSFER CCT.

**SUB. GRP. B**

8-نظ

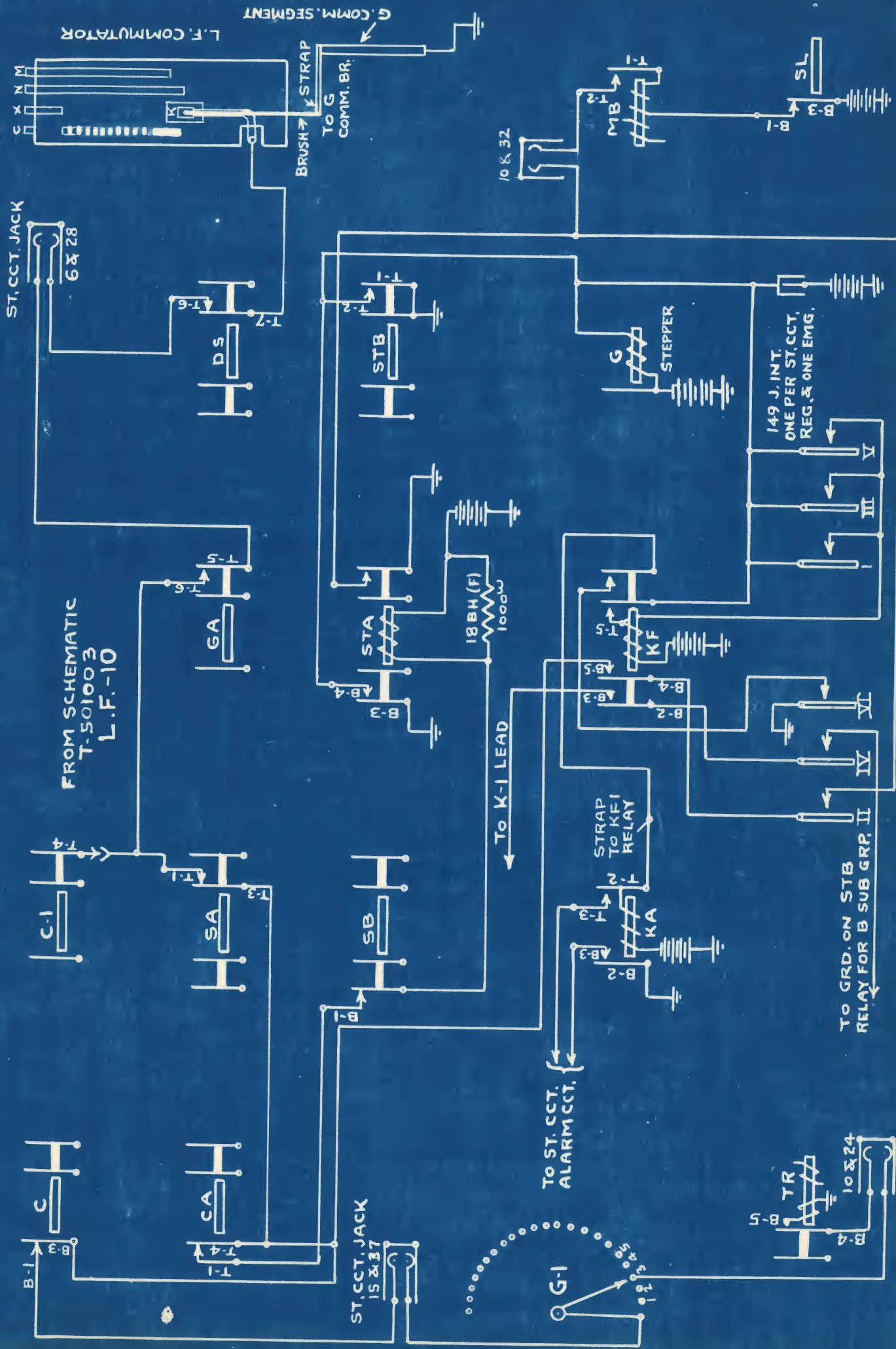
FROM SCHEMATIC T. 501003





L.F. (K) RELEASE CCT,  
SUB GROUP "B"  
FROM SCHEMATIC T-501003  
L.F-9



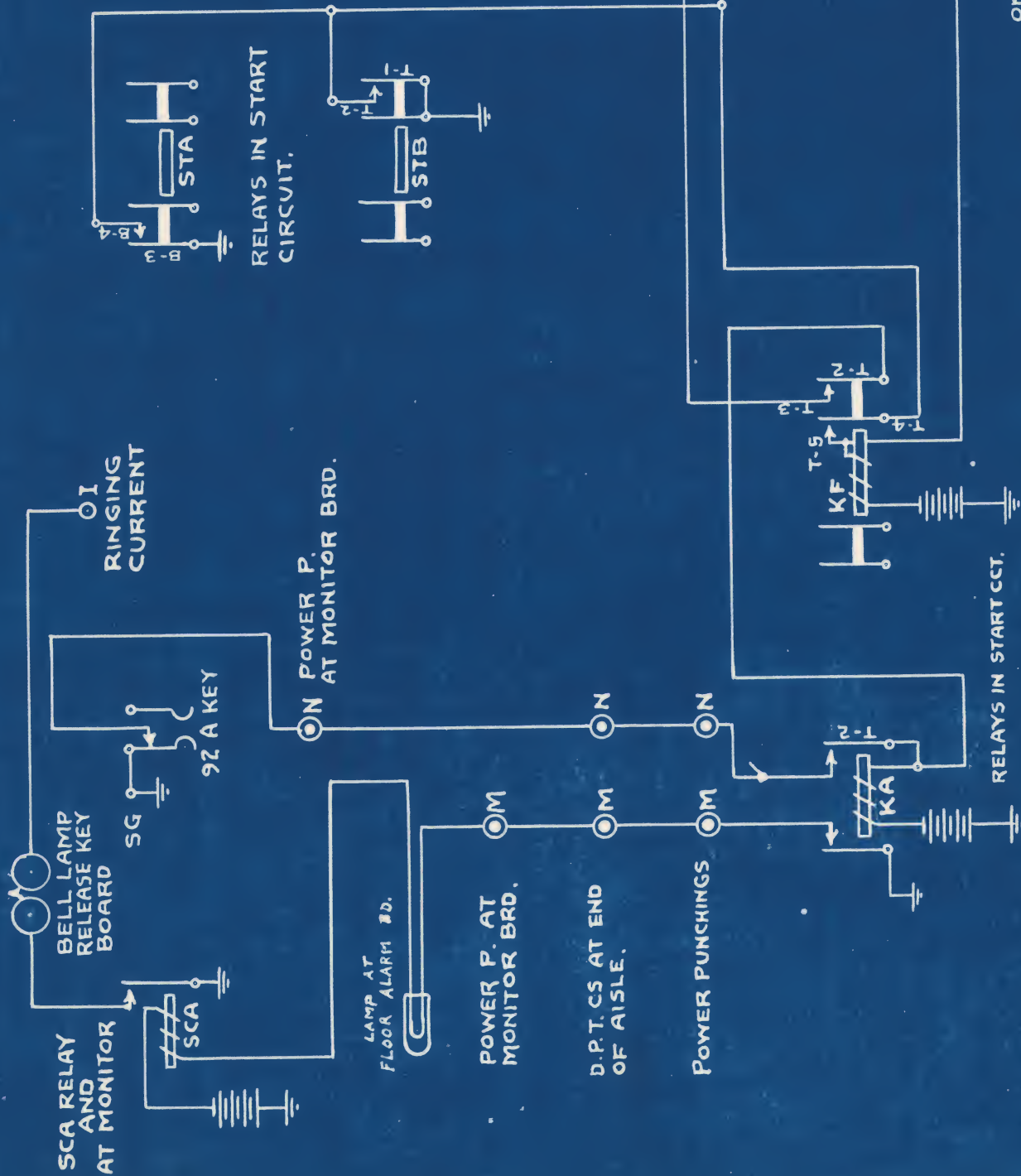








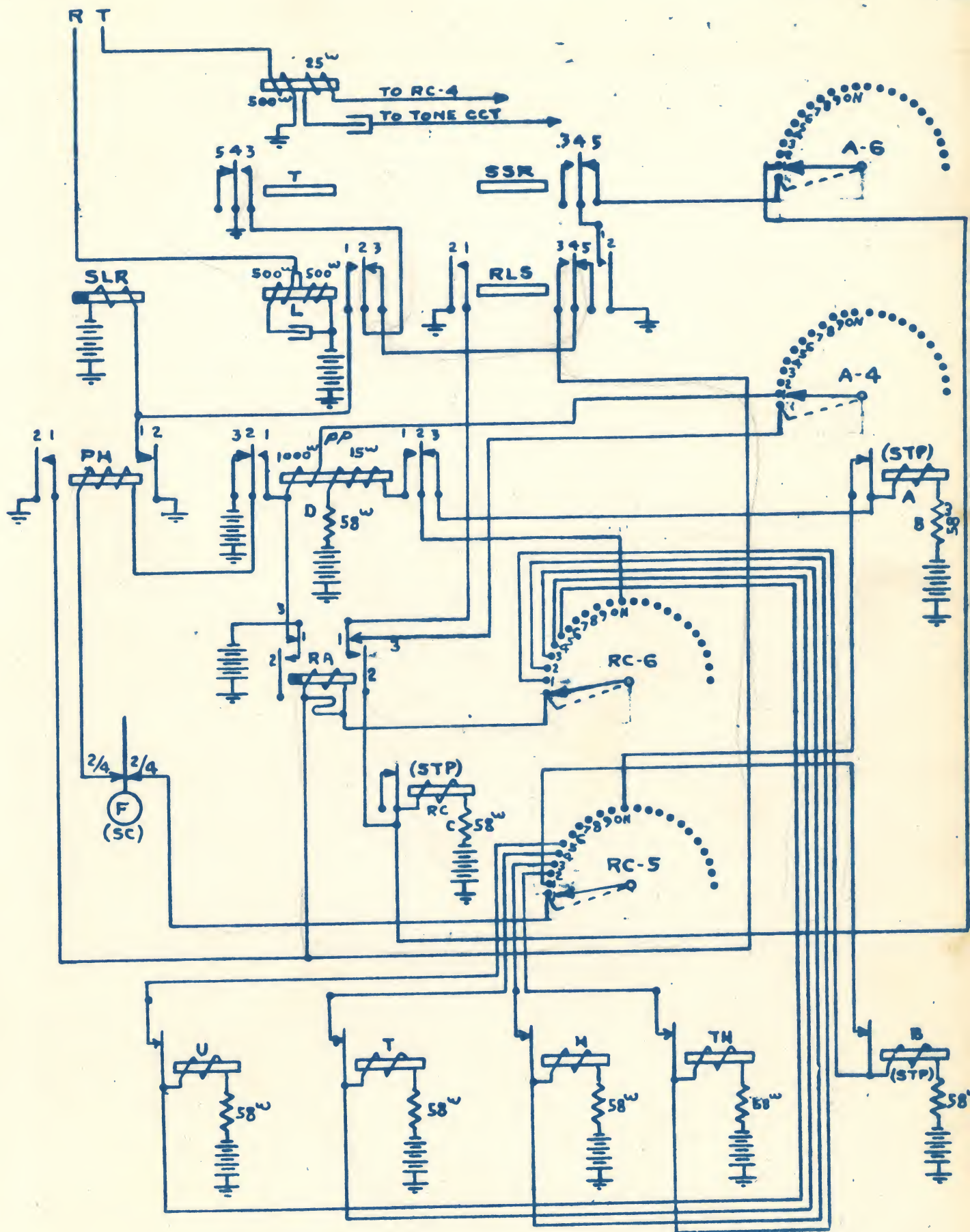




L.F. START CIRCUIT ALARM  
 MADE FROM SCHEMATIC T-502754  
 AND SCHEMATIC T-501665  
 L.F. 13  
 D.P.S. 113

ONE SET OF INTERRUPTERS PER  
 START CCT. AND ONE PER EMG.  
 ST. CCT. LOCATED AT DIST. FRAME.





# PRELIMINARY PULSE, PULSE HELPER AND REGISTRATION CIRCUITS-SENDER

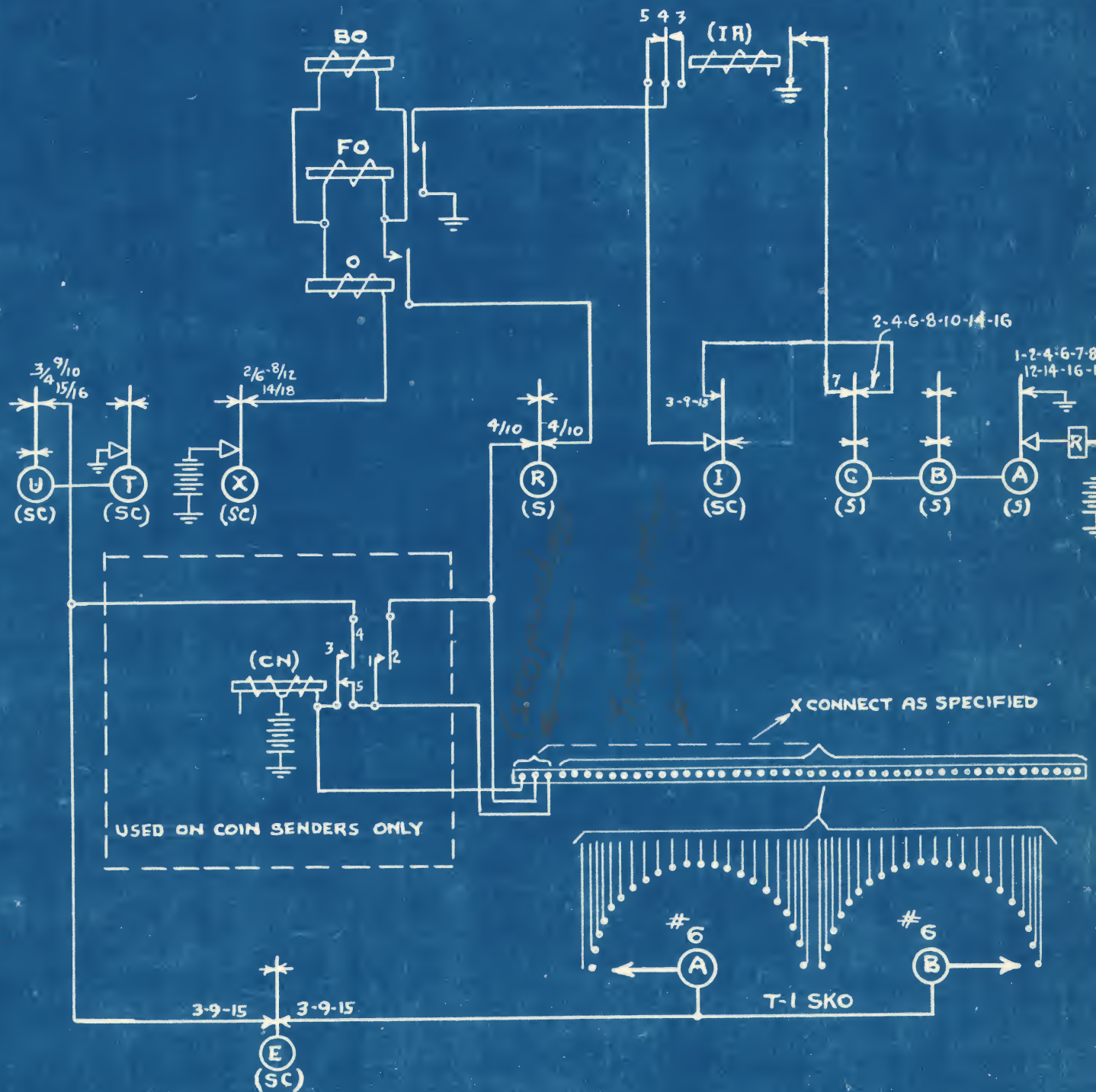
S-4

MADE FROM W.E. CO.'S T-431770

D.P.S. 117

W.B.-A.J.S.

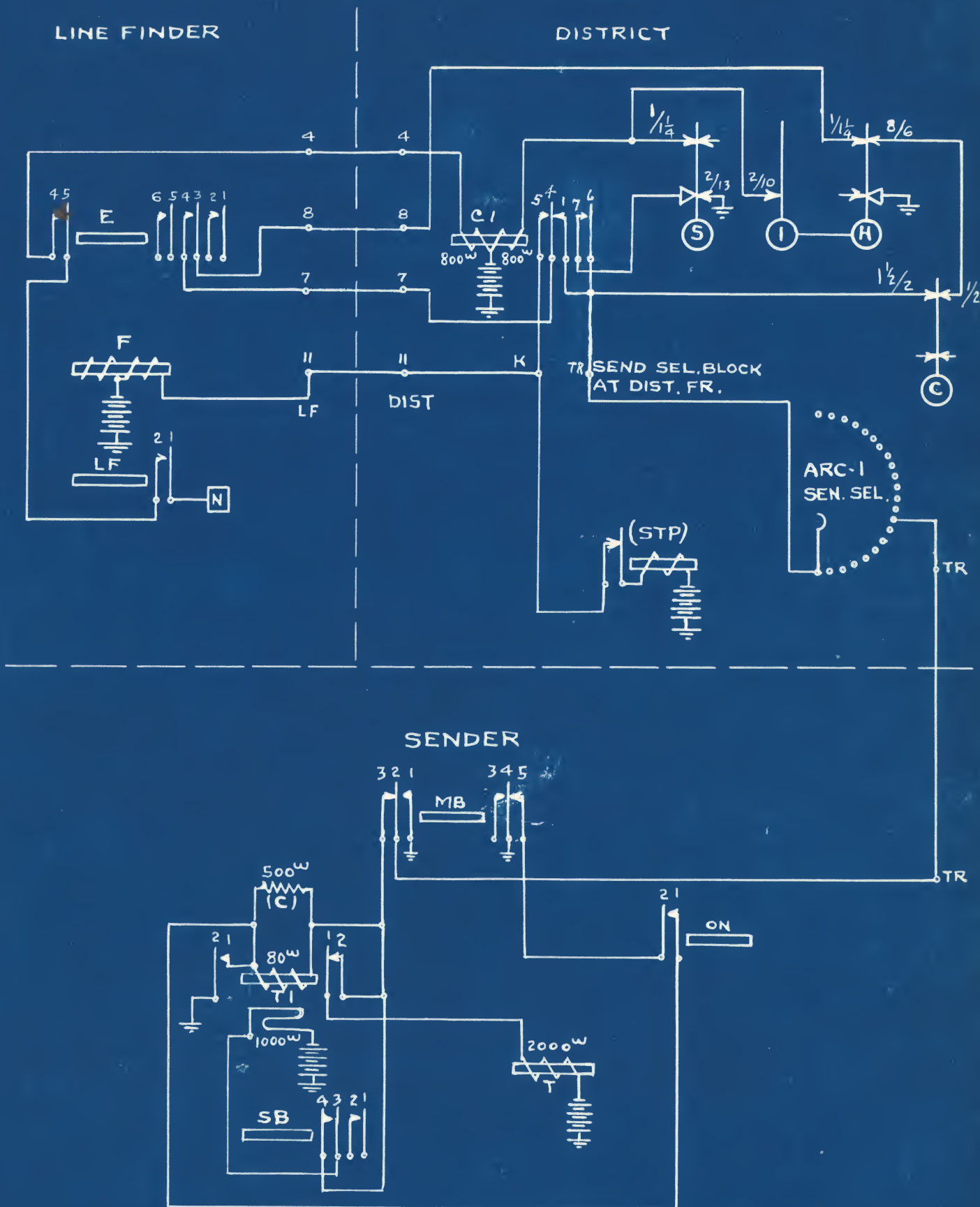




# SKIP OFFICE CIRCUIT - SENDER S-5

MADE FROM W.E. Co's. T-431770  
D.P.S. 118





(TR Lead)

**FUNDAMENTAL TEST LEAD-SENDER**

**S-6**

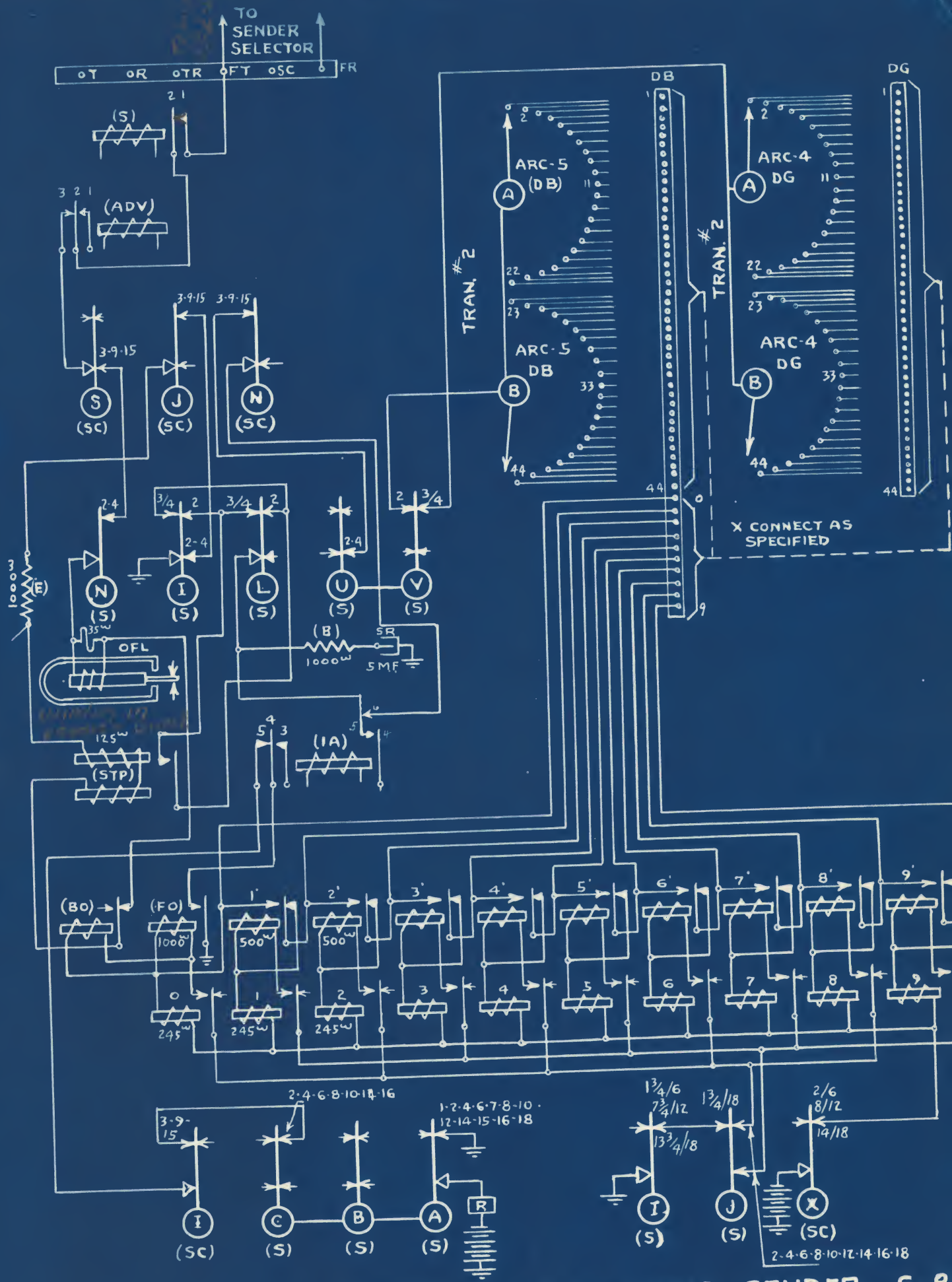
MADE FROM T-431770

D.P.S. 119

W.B. - A.J.S.





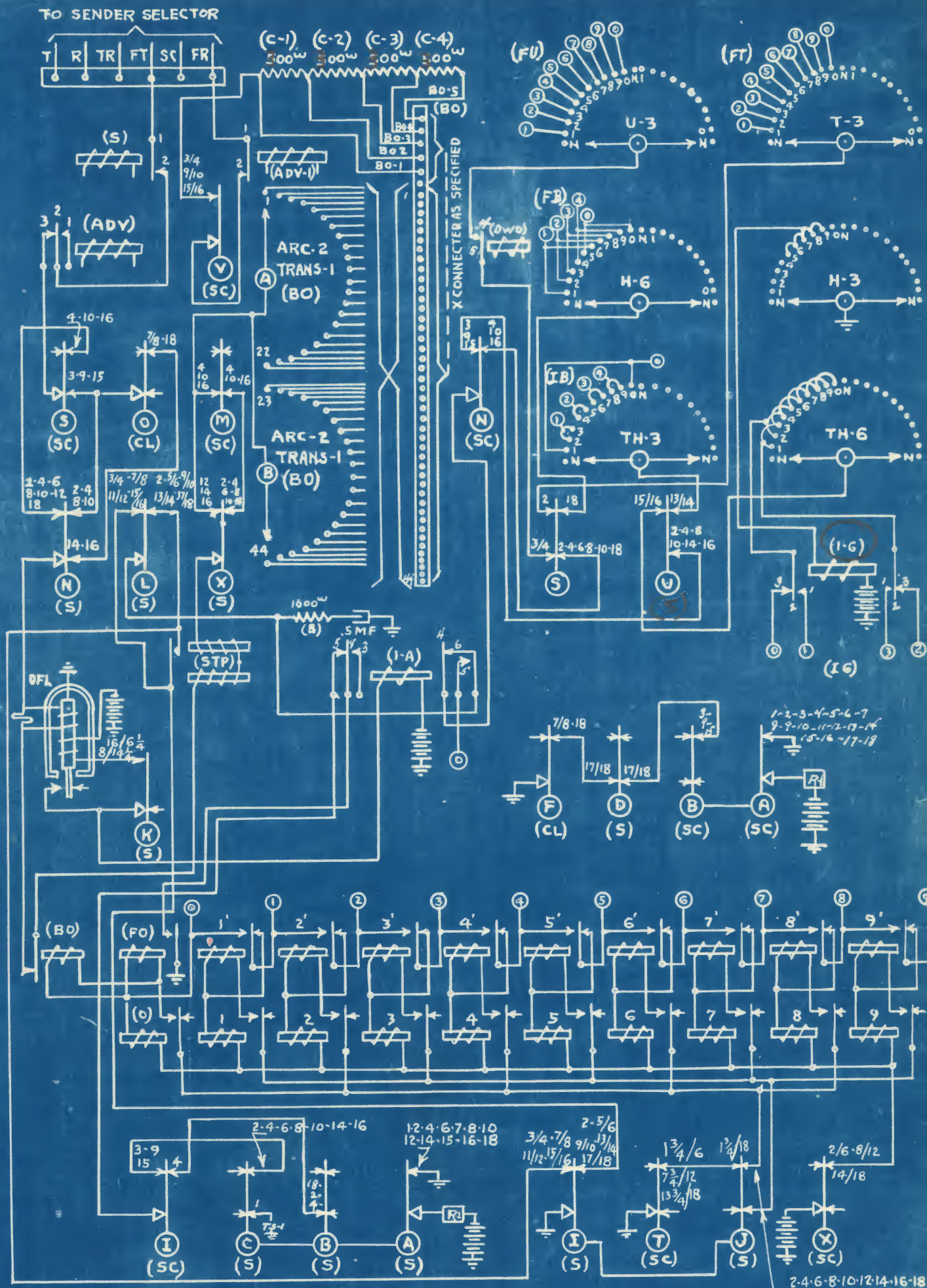


DISTRICT SELECTIONS-SENDER. S-8

MADE FROM T-431770  
D.P.S. 121

W.B. - A.J.





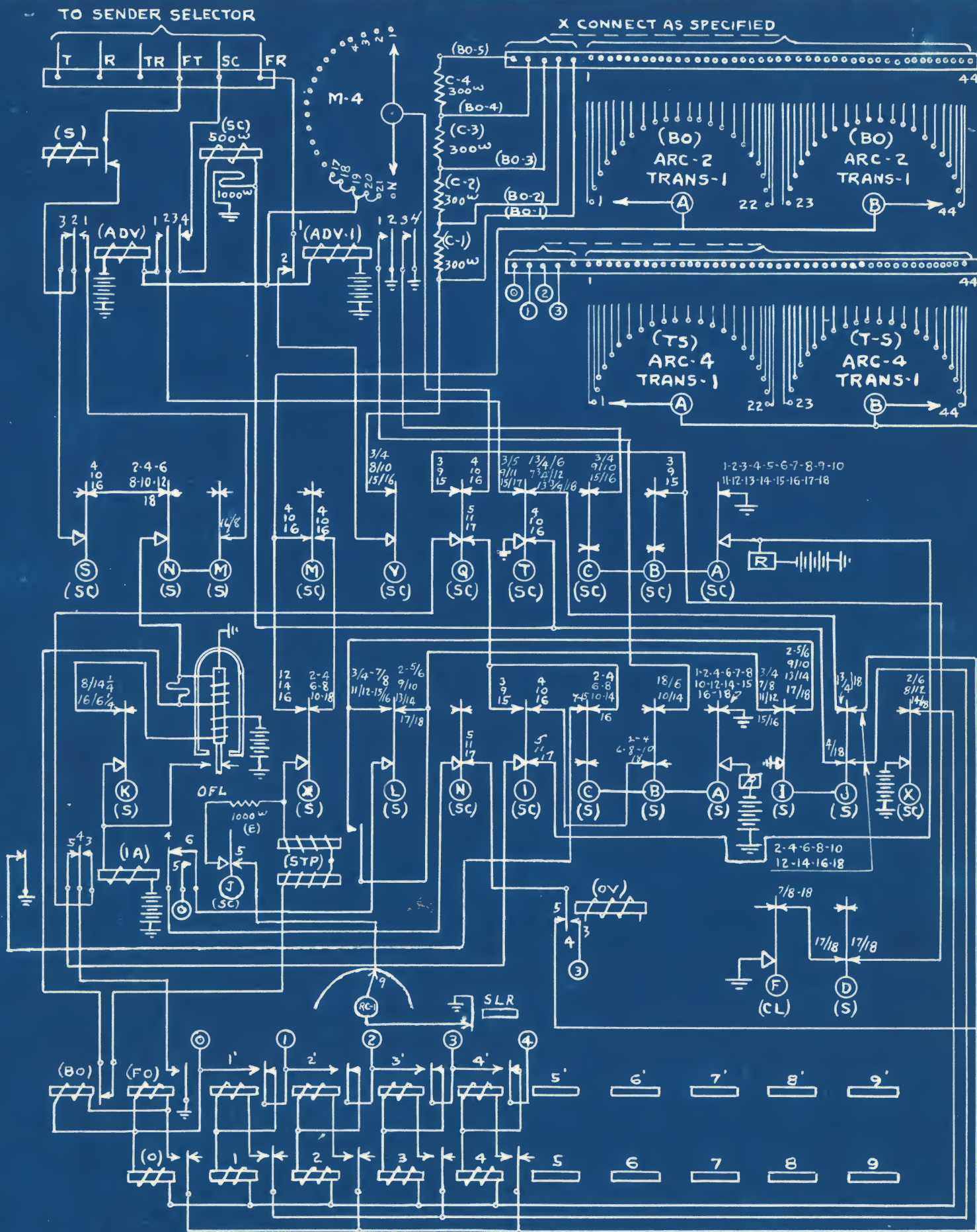
INCOMING AND FINAL SELECTIONS-SENDER 5-9

MADE FROM T-431770

-D.P.S. 122-

W.B. A.J.S.





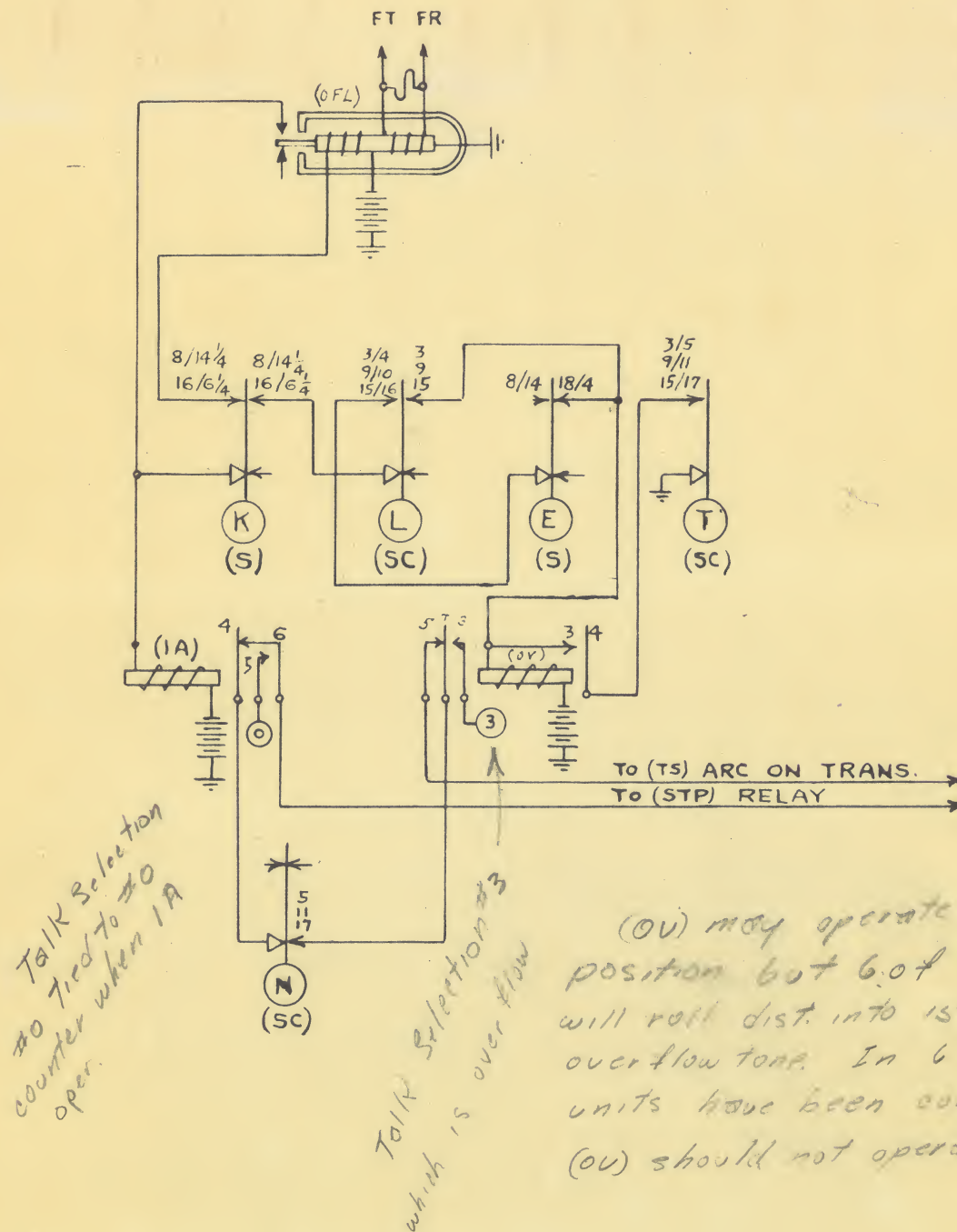
INCOMING ADVANCE AND TALK SELECTION-SENDER

MADE FROM T-431770

S-10

D.P.S. 123

W.B. 2-1-1



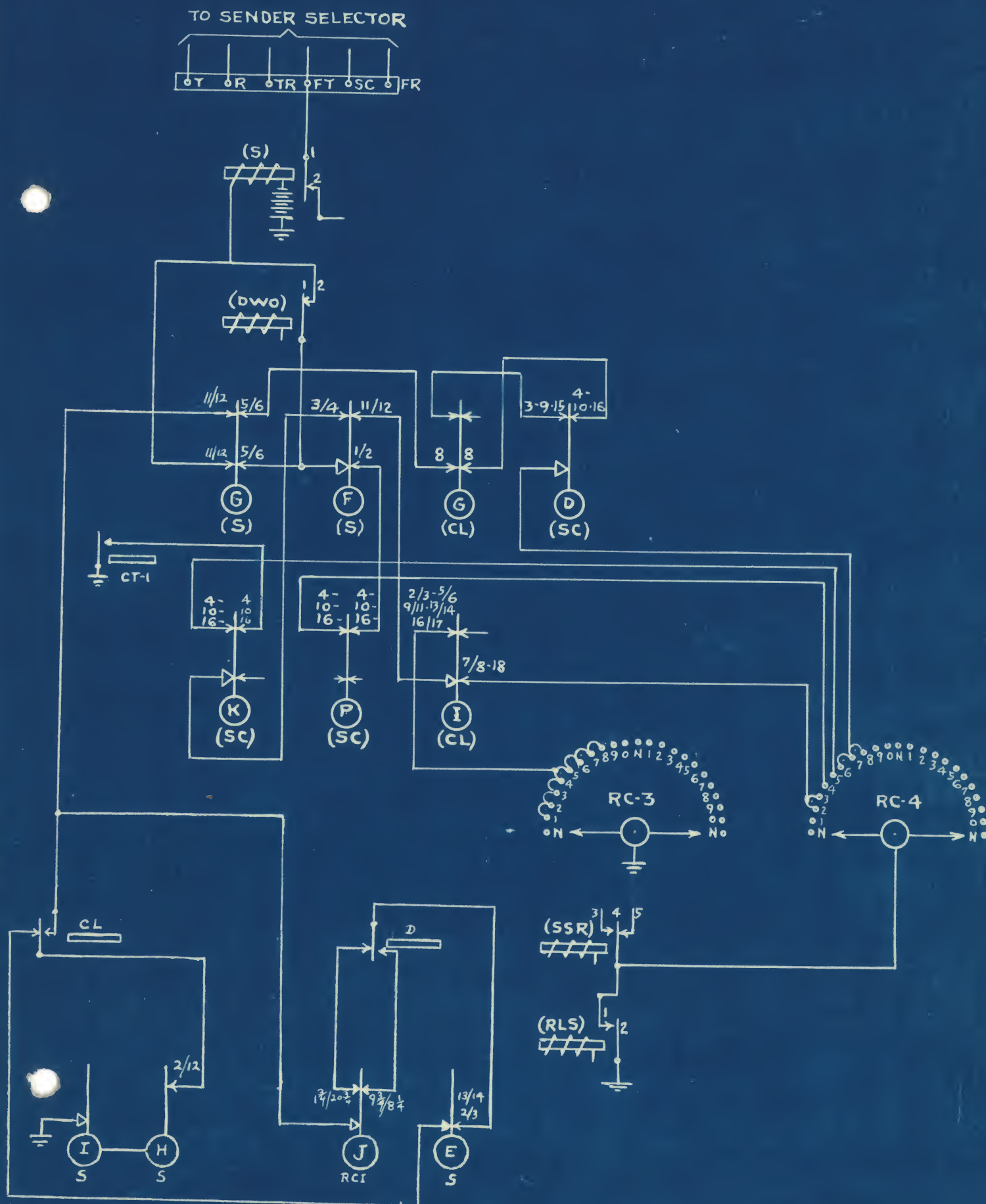
# OPERATING AND HOLDING PATH OVERFLOW RELAY-SENDER

S-II

MADE FROM T-431770

D.P.S. 124





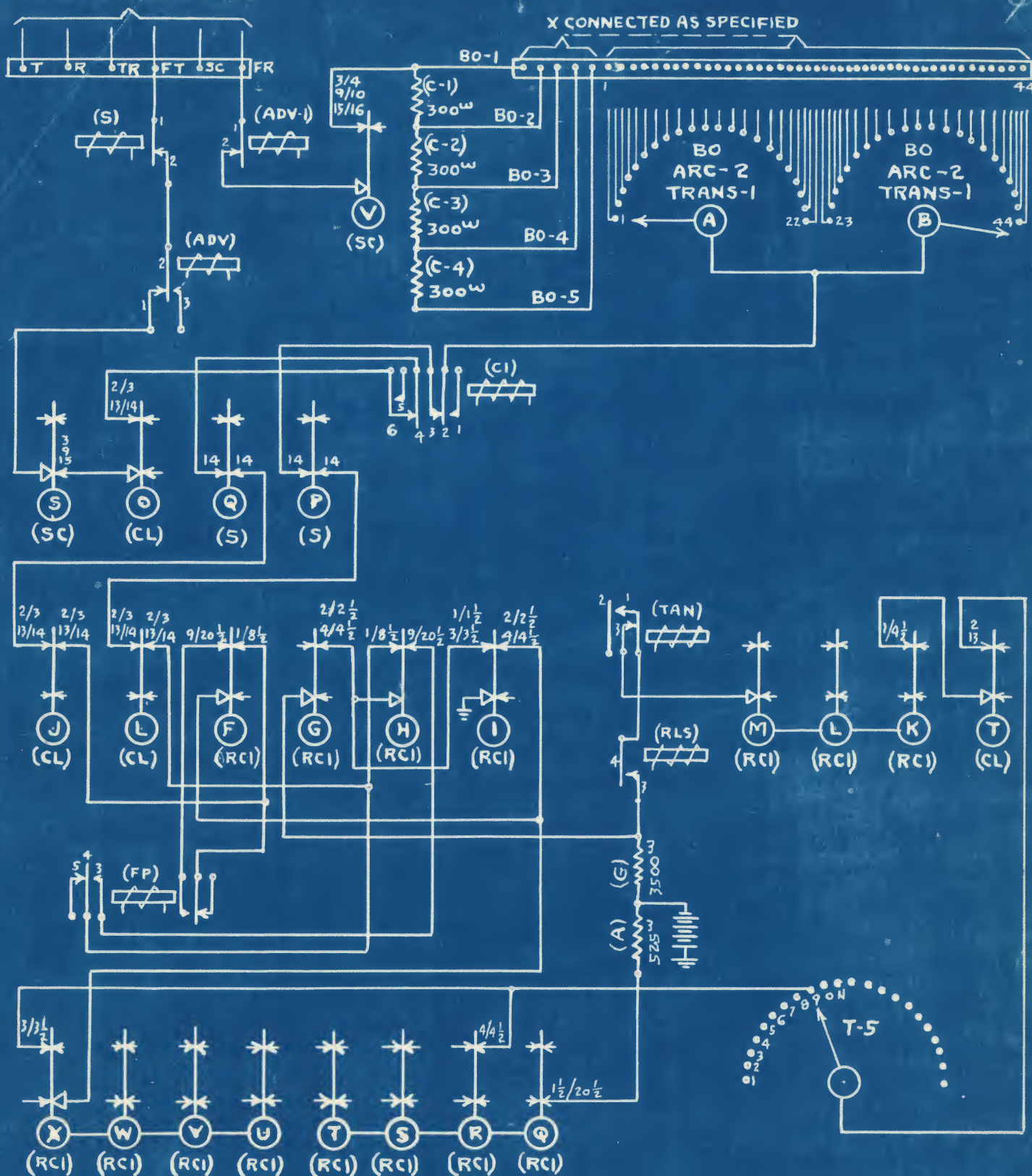
# SYNCHRONIZING CIRCUIT-SENDER

MADE FROM 431770

D.P.S. 125

S-12

TO SENDER SELECTOR



Pulses over Ring - Negative

Pulses over Top - Positive

(Heavy Neg. - 2 max in parallel in series)  
Current flow = heavy neg. over Ring

TENS	PULSES			
9	-	+	-	-
RCI SWITCH POS.	1/1½	2/2½	3/3½	4/4½

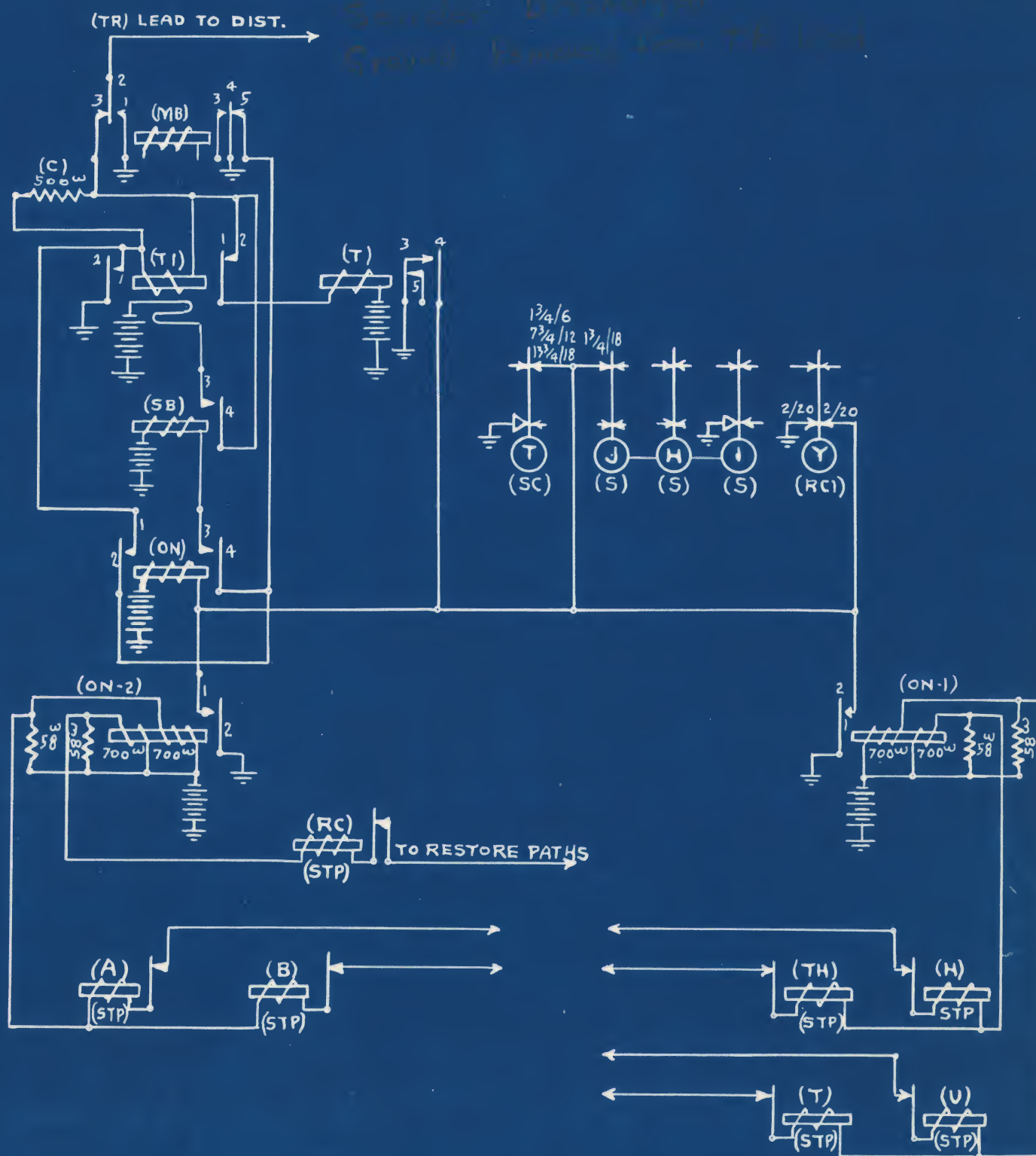
RCI PULSING - SENDER. S-13

MADE FROM T-431770

DPS-126

W.B.-A.I.S.



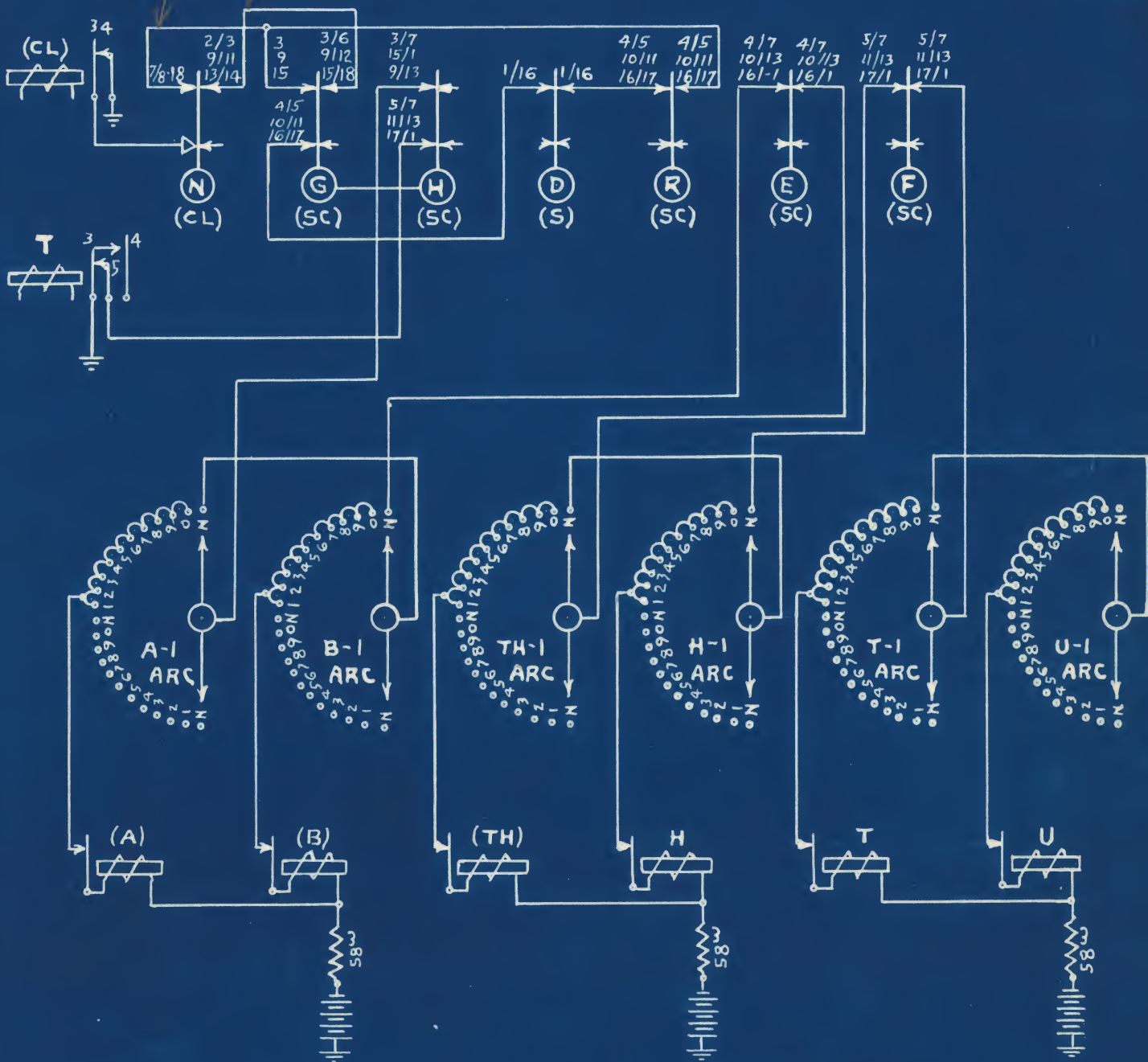


MAKE BUSY CIRCUIT TO OFF NORMAL GROUND-SENDER

MADE FROM T-431770

D.P.S. 127

S-14



# REGISTER RESTORE CIRCUIT-SENDER

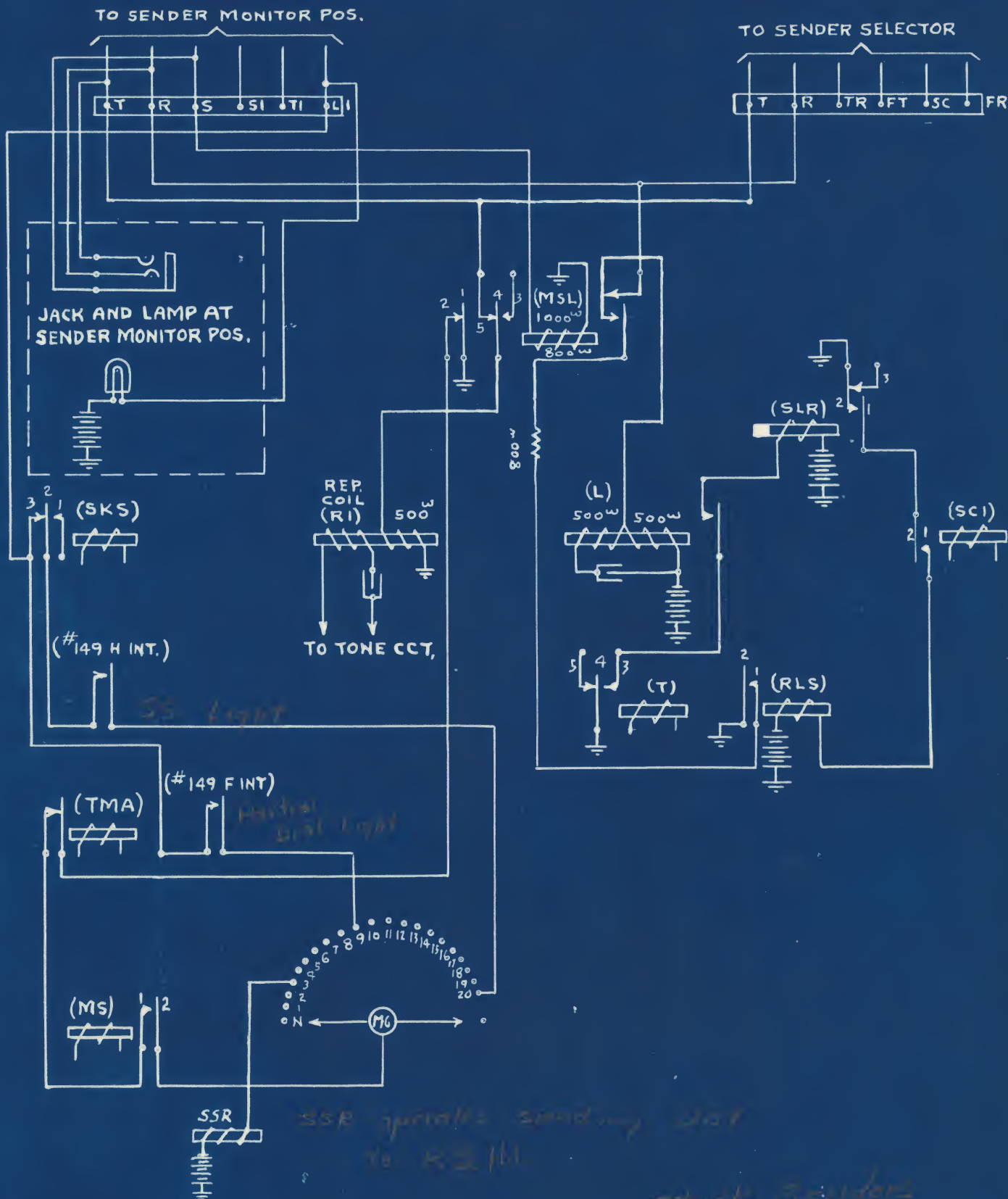
MADE FROM T-431770

D.P.S. 128

5-15

W.B. - A.J.S.



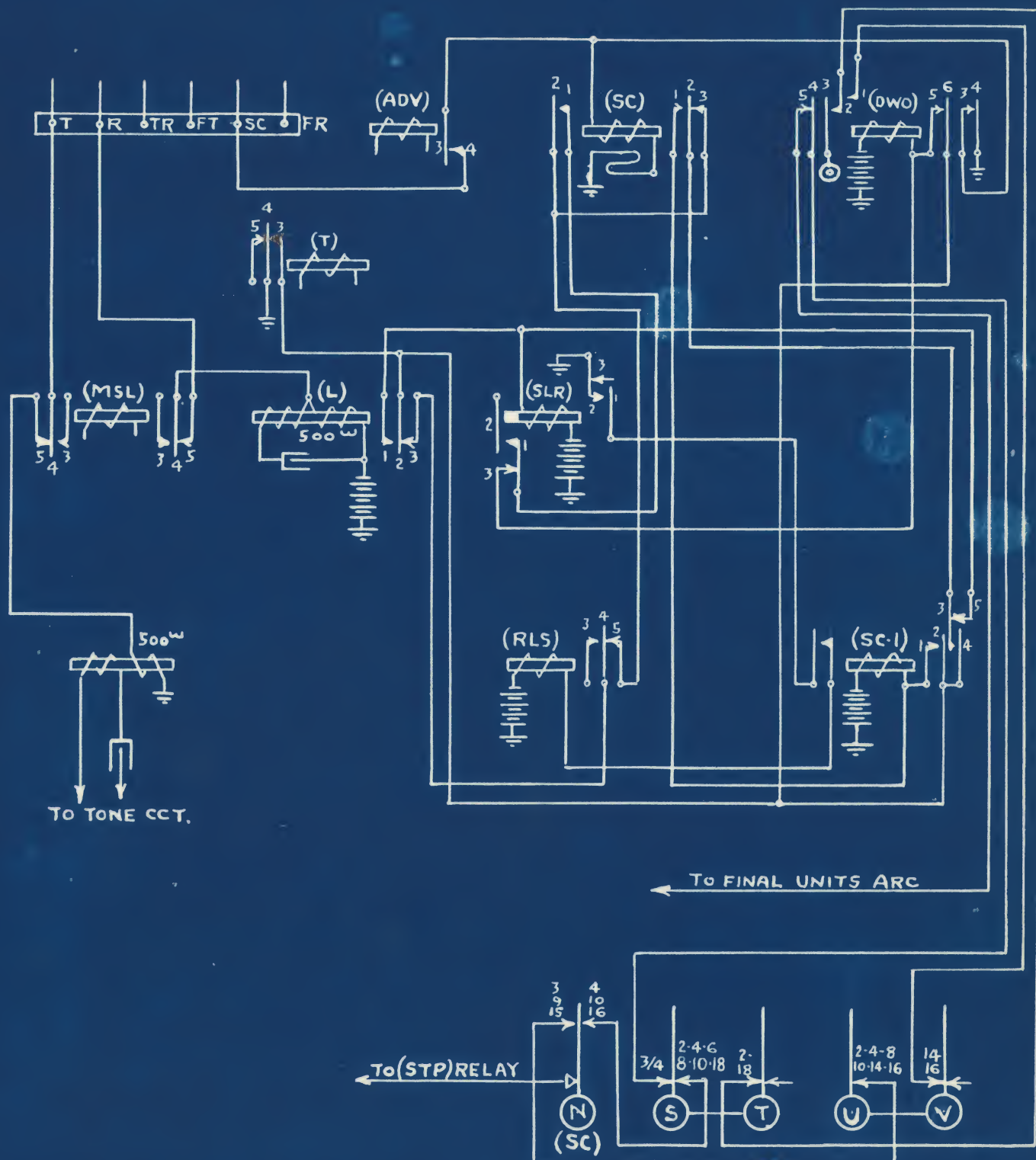


# MONITORING CIRCUIT-SENDER.- S-16

MADE FROM T-431770

D.P.S. 129

W.B. - A.J.S.



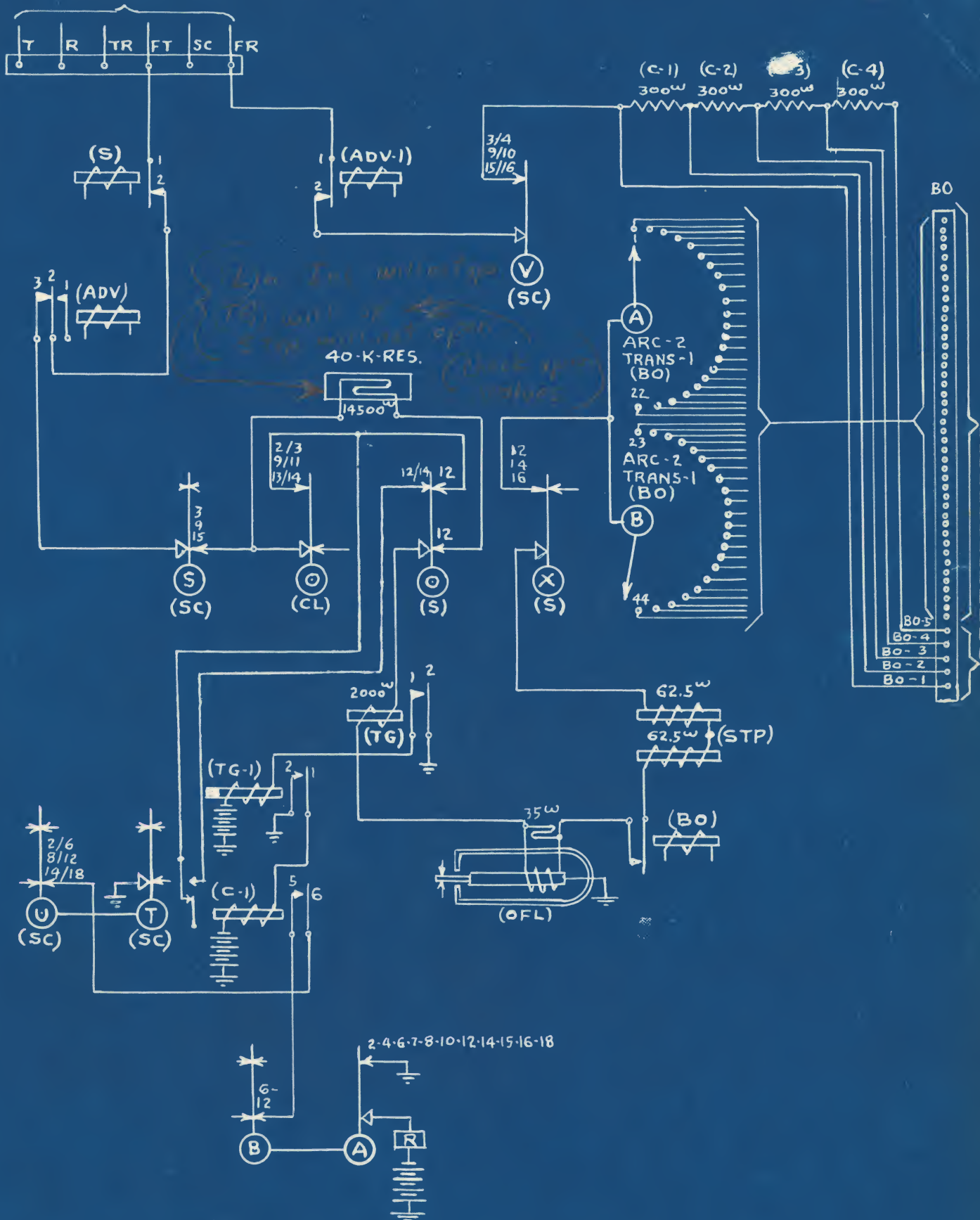
# DELAYED WIPE OUT CIRCUIT-SENDER, S-17

MADE FROM T-431770

D.P.S. 130



TO SENDER SEL. CCT.



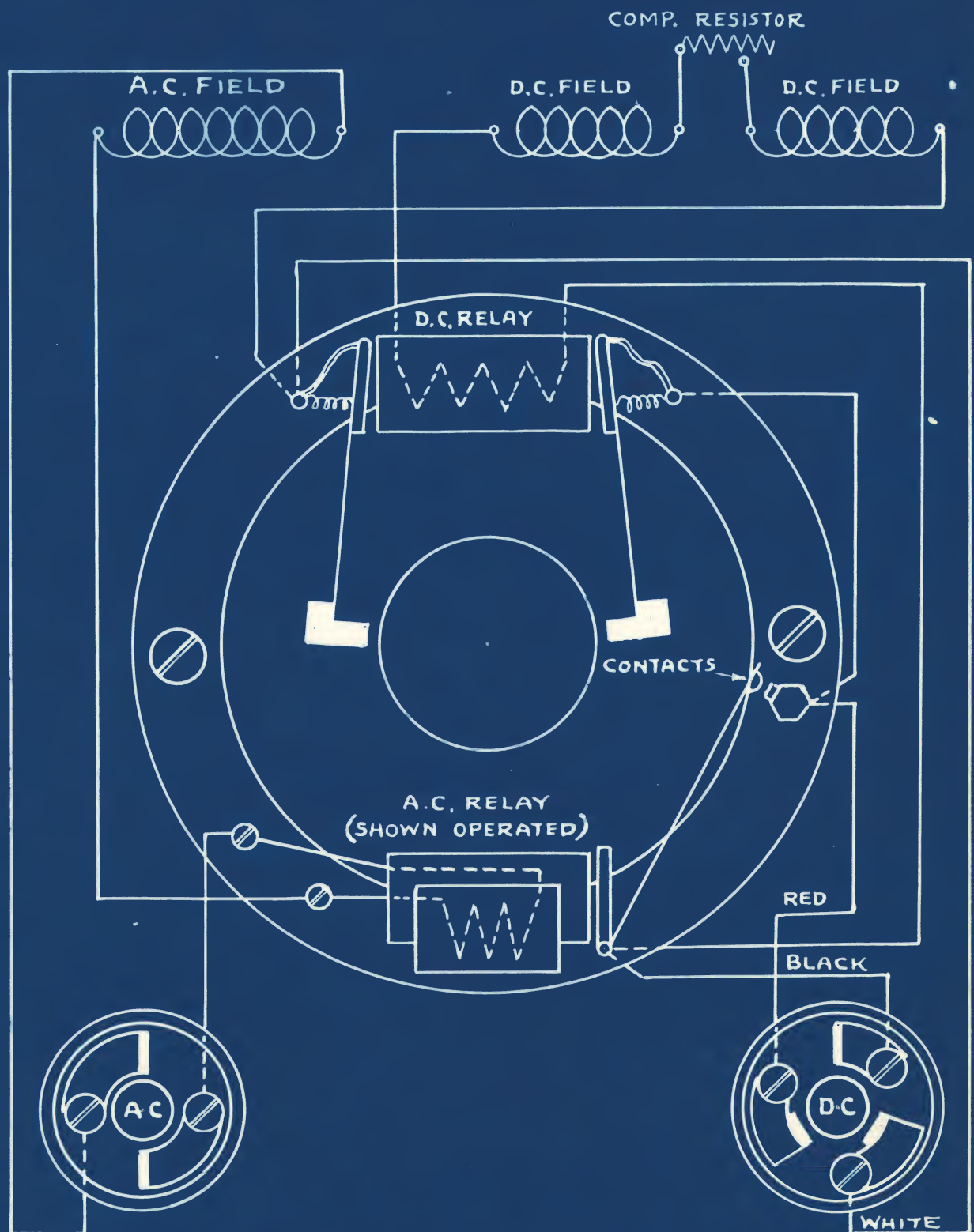
TRUNK TEST CIRCUIT, R.C.I. & F.M.-SENDER, S-1

MADE FROM T-431770

D.P.S. 131







THE PACIFIC TEL & TEL. CO.  
MAIN OFFICE - SEATTLE

DUPLEX MOTOR  
FRAME DRIVE (PANEL)  
WIRING DIAGRAM

DWG. D.P.S. 134

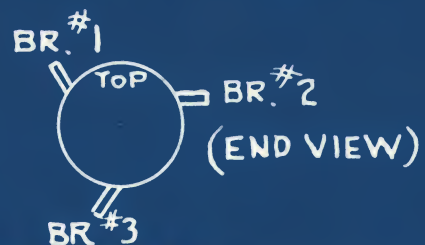
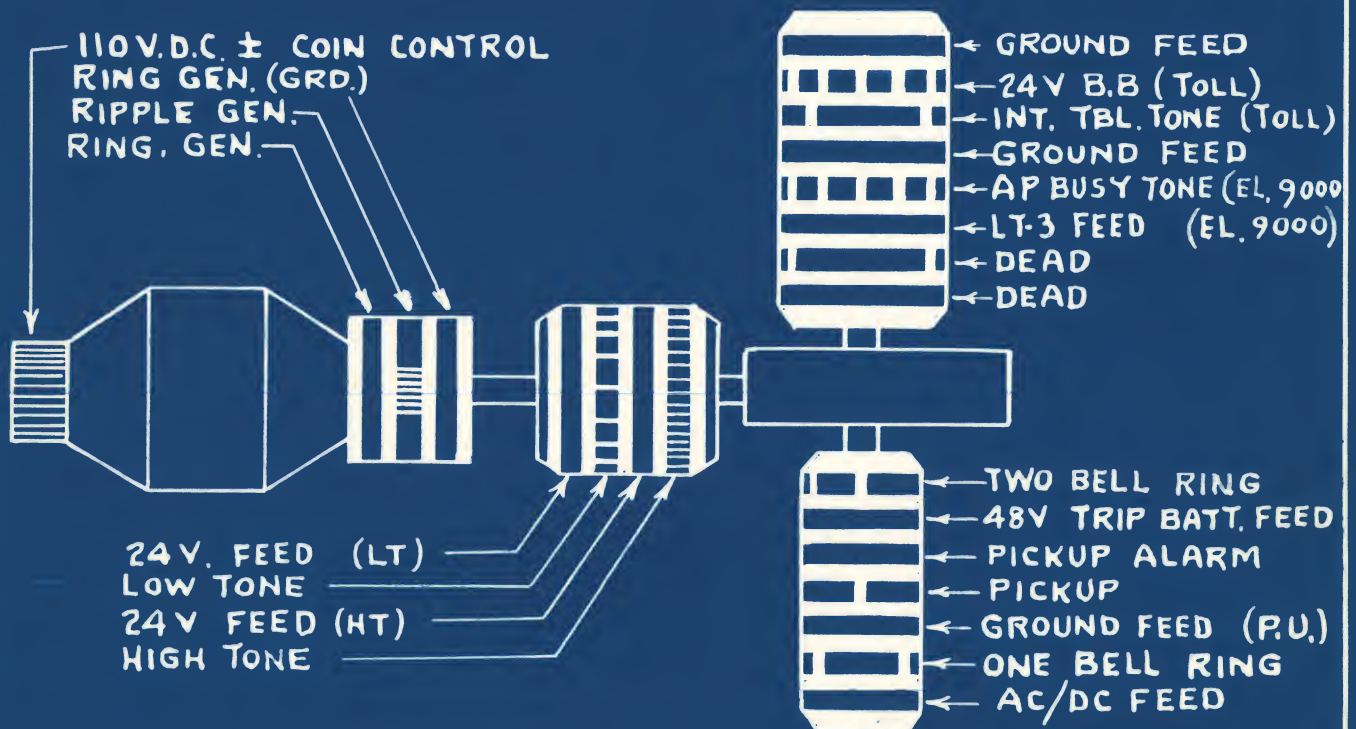
DRAFTSMAN A.J.S. 4-7-


ORIGINAL BY H.A.W. 155. N

APPROVED

# RINGING GENERATOR

## CHART No 1



THE PACIFIC TEL & TEL. CO. MAIN OFFICE - SEATTLE	DWG. D.P.S. 135		
	DRAFTSMAN	AJS	12-6-39
RINGING & COIN CONTROL GEN. HIGH & LOW SPEED INTER'T'R ARRANGEMENTS	ORIGINAL BY	Hall	155, No 1
	APPROVED 		



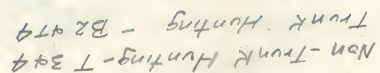
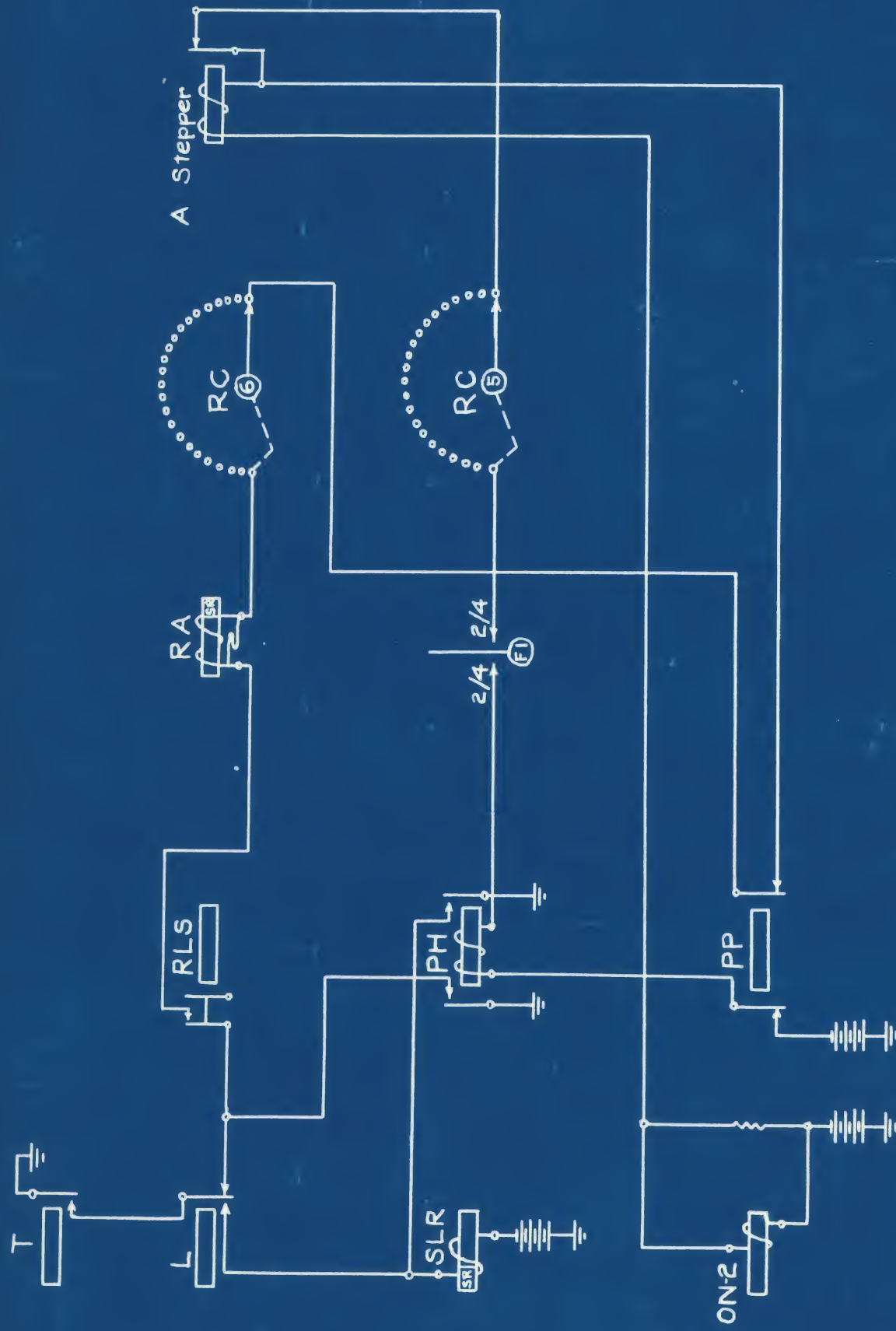


FIG. C  
WITH TRIP CIRCUIT  
RELEASE FEATURE

THE PACIFIC TEL. & TEL. CO. SEATTLE, WASH.	DWG. NO.	DMS 136
	ORIGINAL	CES. 11-9-35
	DRAFTSMAN	E.M.
LINE FINDER TIME ALARM CIRCUIT	APPROVED	

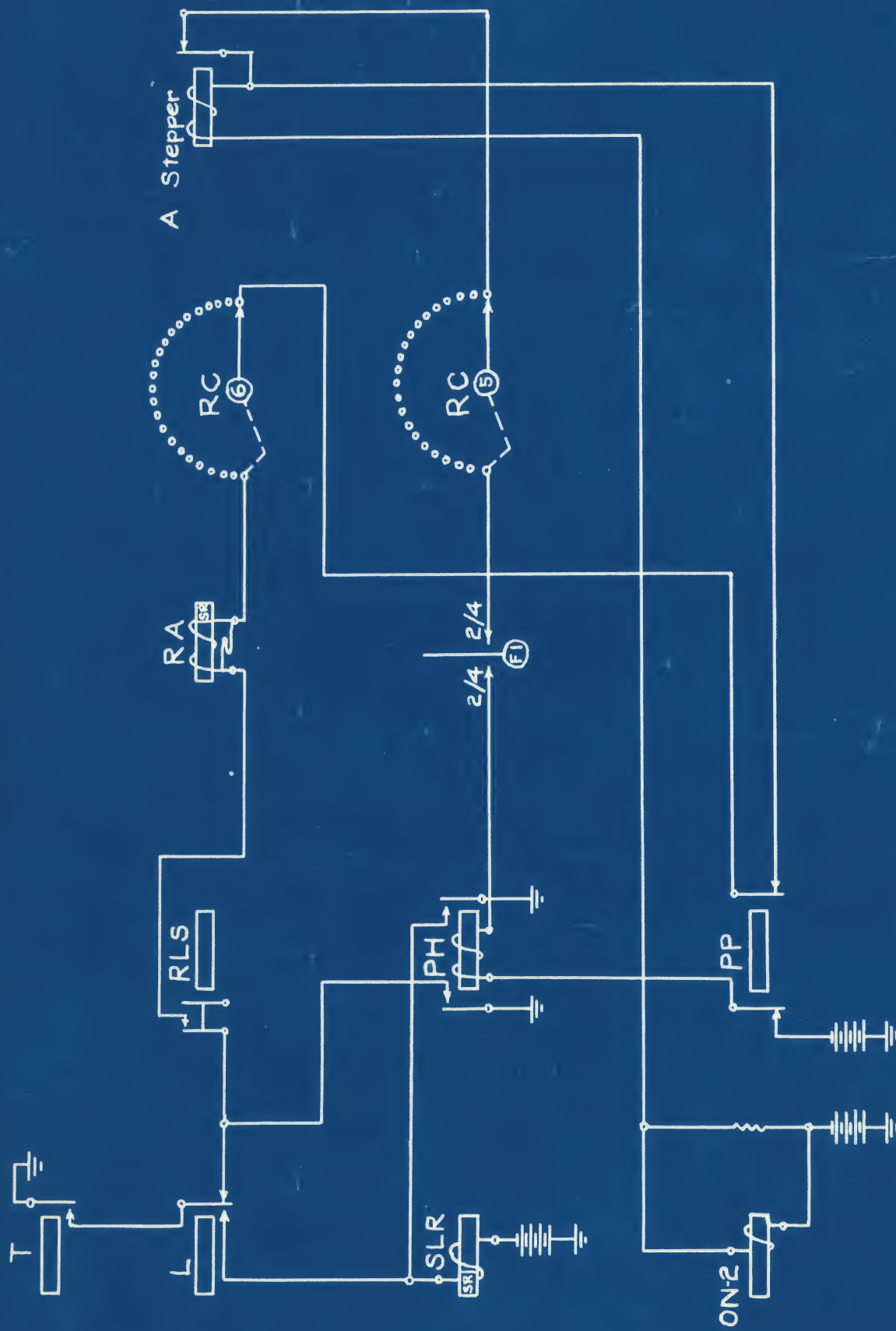


NOTE:- THE PH RELAY IS FAST OPERATING

OPERATION AND FUNCTIONS OF PH RELAY  
SENDER CCT.— FROM SCHEMATIC ES 226610-52D  
D.R.S. 141

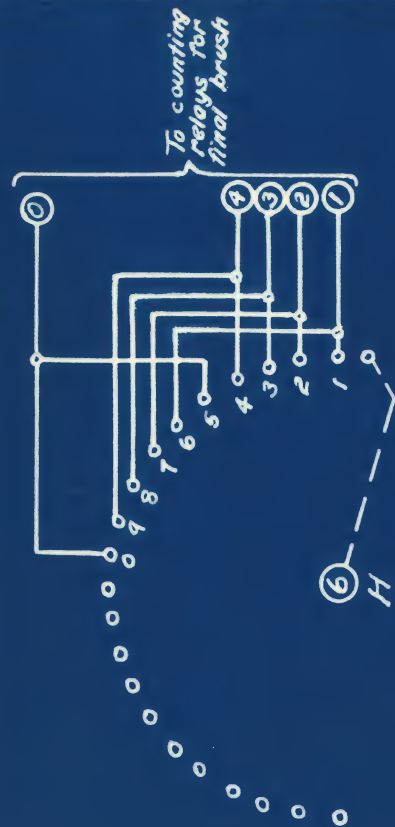
V.A.B.



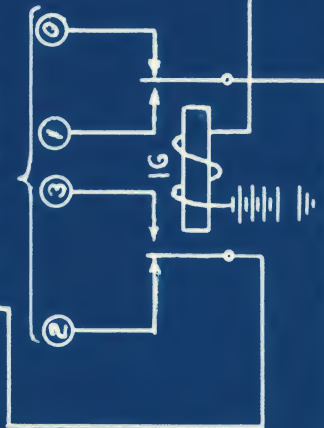


NOTE:- THE PH RELAY IS FAST OPERATING

OPERATION AND FUNCTIONS OF PH RELAY  
SENDER C.T.— FROM SCHEMATIC ES 226610-52D  
D.P.S. 141



To counting relays for inc. group

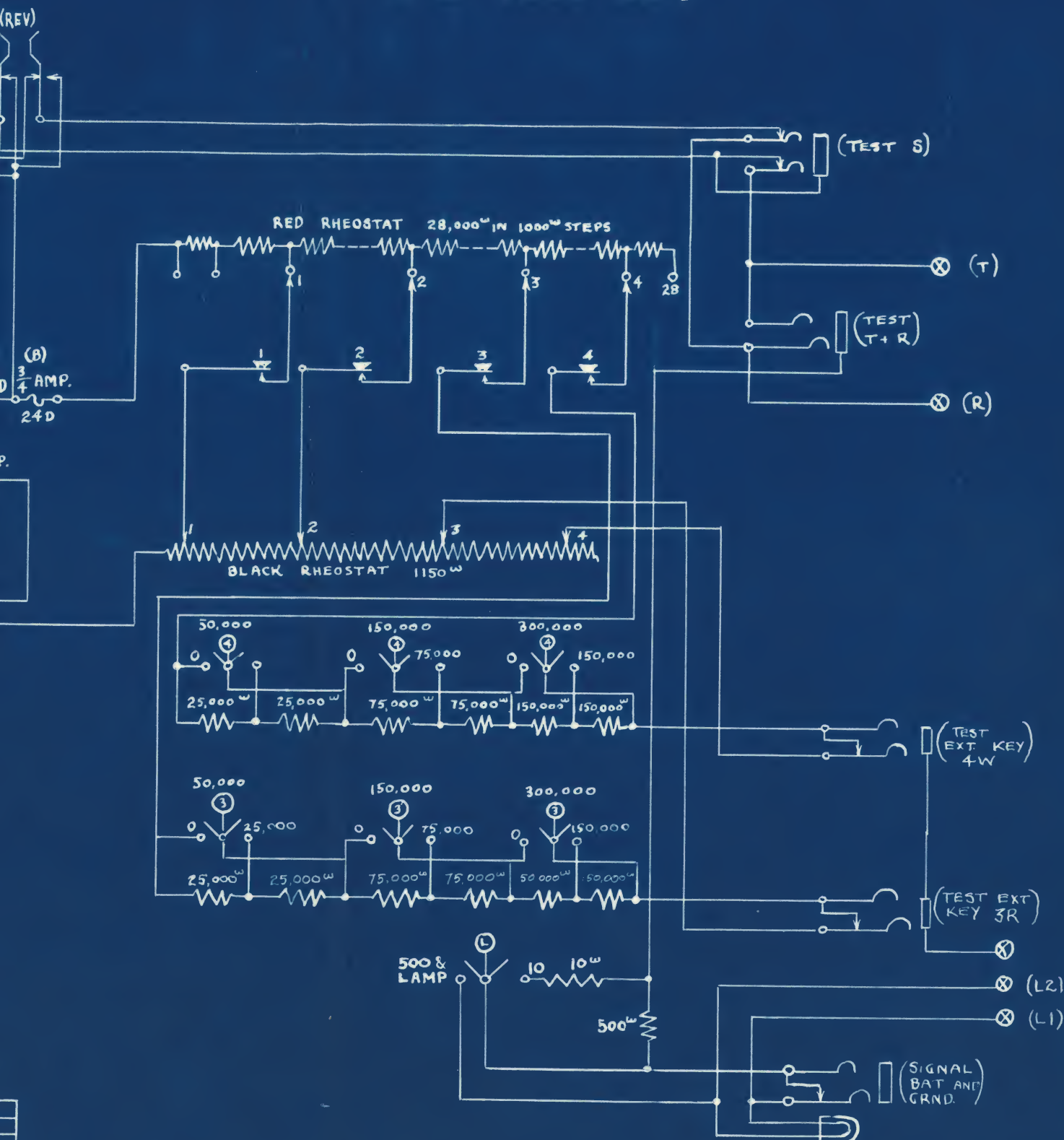


SENDER REGISTERS - I.B., I.G., F.B. SELECTION  
FROM SCHEMATIC ES 226610-52D  
D.P.S. 142

V.A. 8



# 35 D TEST SET



THE PACIFIC TEL. & TEL. CO.  
SEATTLE, WASH.

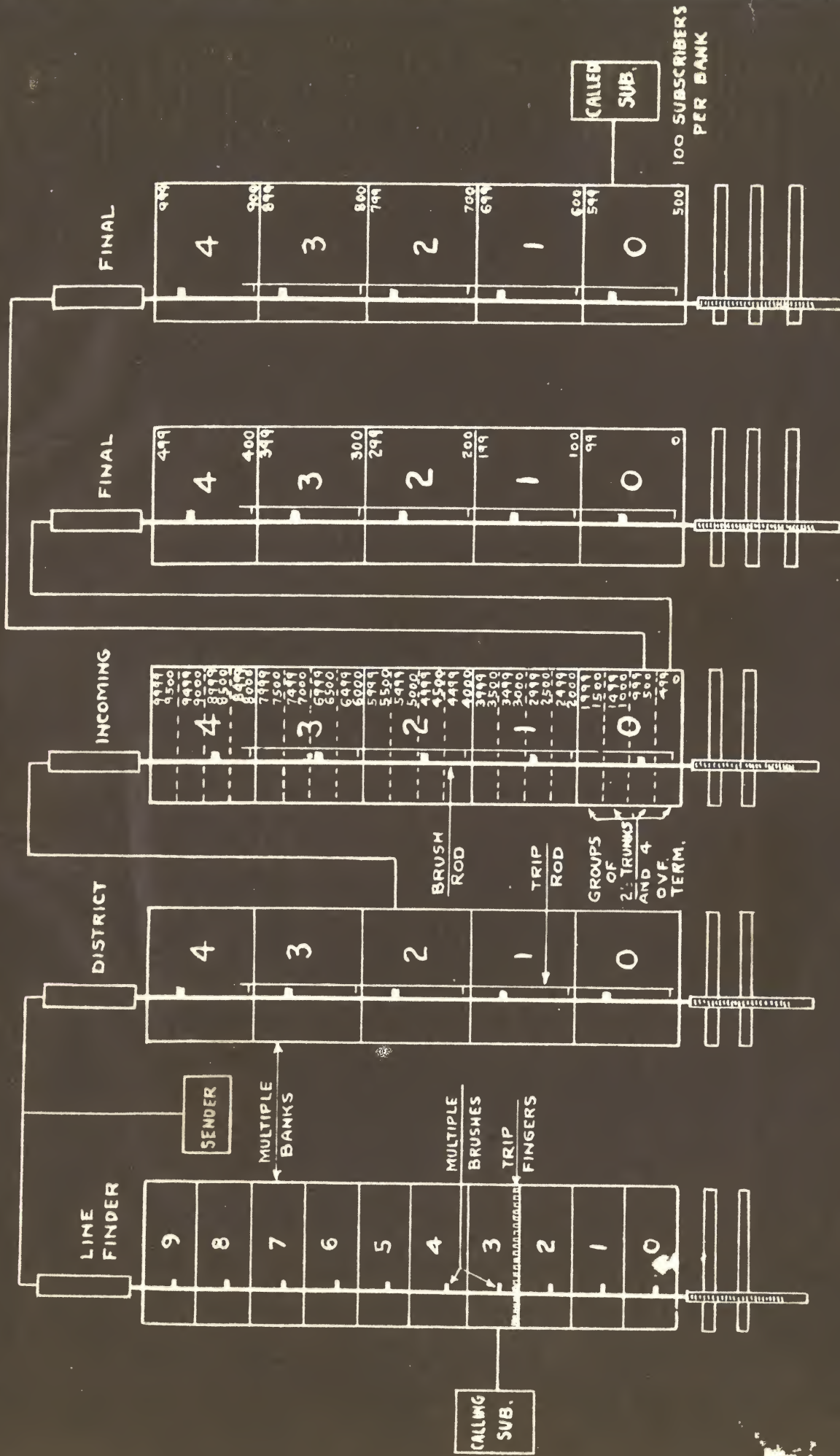
35 D TEST SET

DWG. No D.P. 5. 147

DRAFTSMAN LEE 4-1-41

APPROVED D.V. ISS. No 1

# SEQUENCE OF FRAMES

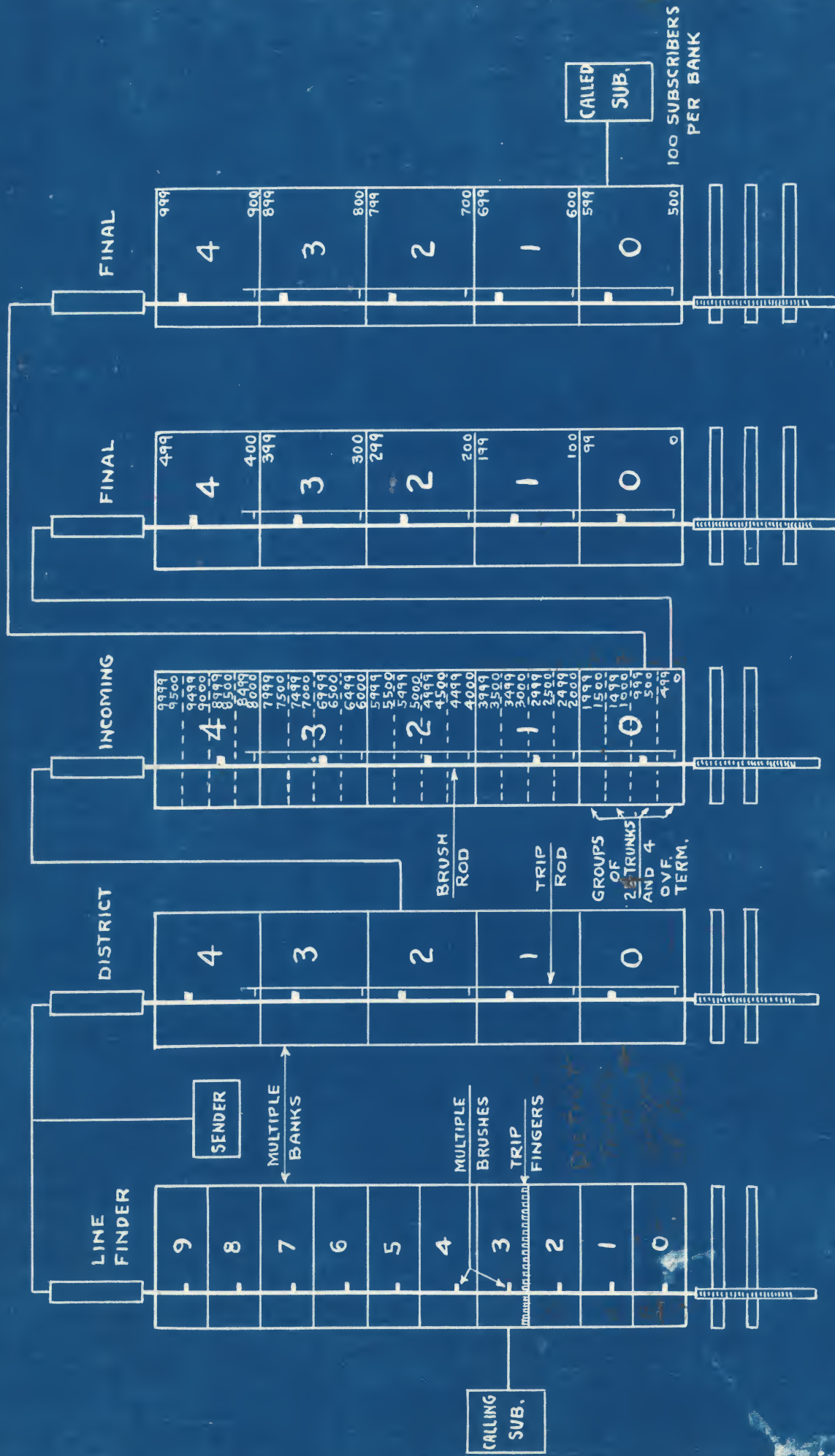


GROUPING OF INCOMING TRUNK MULTIPLE  
AND SUBSCRIBER'S MULTIPLE

CHART NO. 1  
SEATTLE PLANT SCHOOL

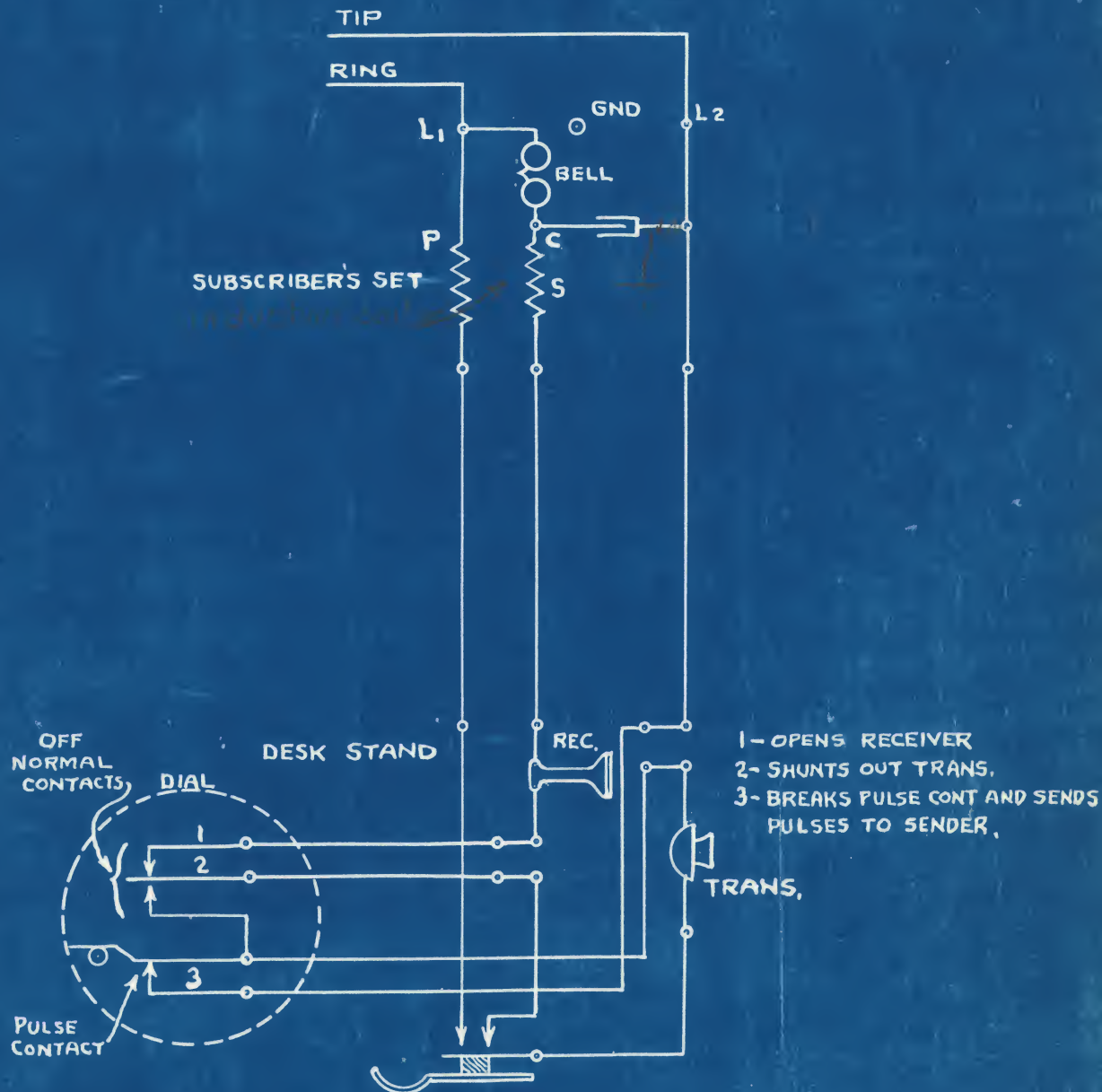


# SEQUENCE OF FRAMES



## GROUPING OF INCOMING TRUNK MULTIPLE AND SUBSCRIBER'S MULTIPLE

CHART NO. 1  
SEATTLE PLANT SCHOOL



NOTE:- WHEN PULSE CONTACT IS MADE, RECEIVER CIRCUIT IS OPENED UP, WHILE TRANSMITTER CIRCUIT IS SHORTED OUT.

THE PACIFIC TEL. & TEL. CO.  
PLANT SCHOOL  
SEATTLE

DIAL SUBSTATION

DWG No.

D.P.S. 150

DRAFTSMAN

A.J.S.

DATE  
2-20-30

CHECKED BY

R.G.M.

ISSUE-1

APPROVED

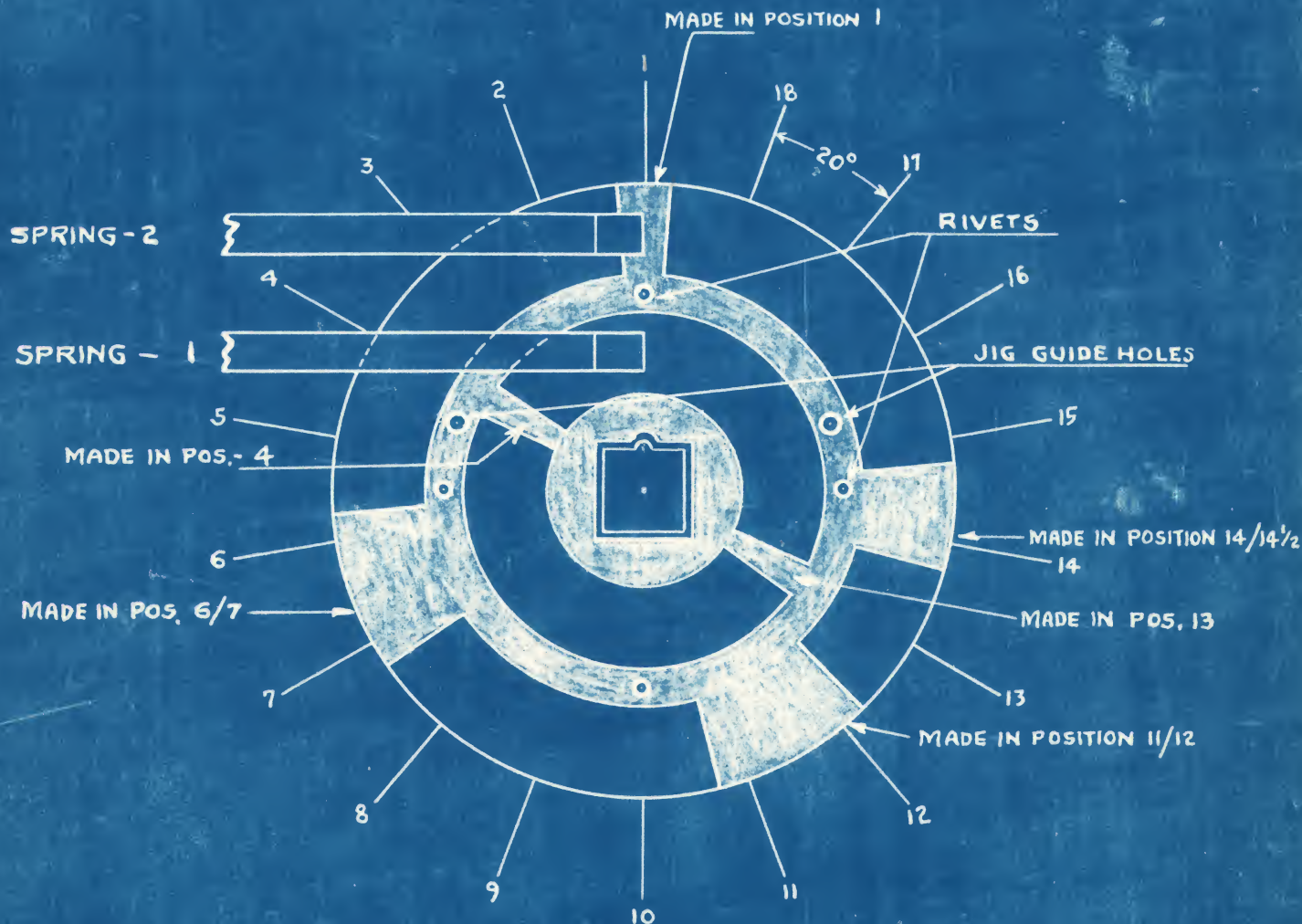
*adm.*

APPROVED

NO SCALE

10/32





**- NOTE -**

SEQUENCE SWITCH CAM SHOWING  
LEFT HAND SIDE.  
ALL CONTACTS MADE  $\frac{1}{4}$  POSITION  
BEFORE AND AFTER POSITION INDICATED.  
RIVET HEADS INDICATE RIGHT HAND  
SIDE OF CAM. SEEN IN FIG. 10.

WHERE CAM IS POSITIONED

ONLY BY FIG. 10

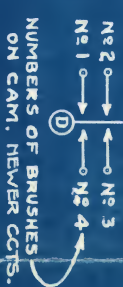
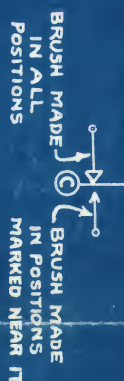
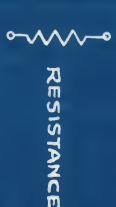
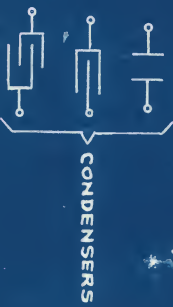
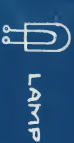
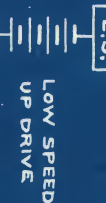
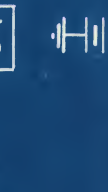
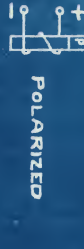
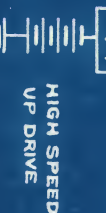
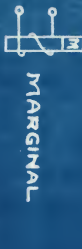
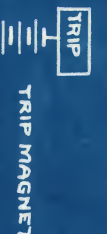
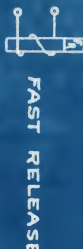
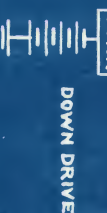
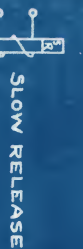
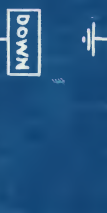
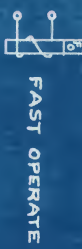
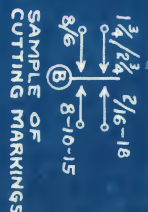
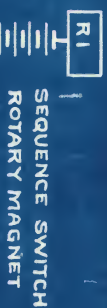
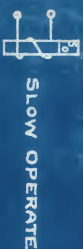
THE PACIFIC TEL. & TEL. CO  
DIVISION PLANT SCHOOL  
SEATTLE

SEQUENCE SWITCH CAM  
SHOWN IN POSITION ONE

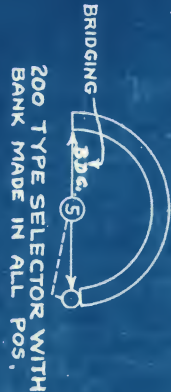
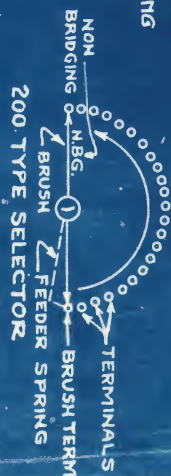
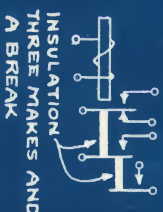
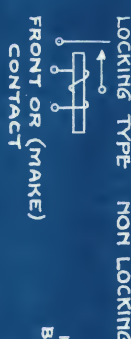
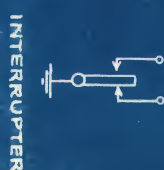
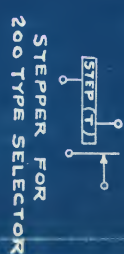
DWG No.	D.P.S. 151	
DRAFTSMAN	AJS	DATE 2-25-30
CHECKED BY	AGM.	
APPROVED	<i>AGM.</i>	ISSUE - I

6  
10

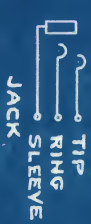




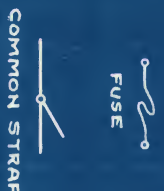
NOTE:- "A" CAM IS OPEN IN ALL POSITIONS MARKED AND CLOSED IN POSITIONS NOT MARKED.



CROSS CONNECTING TO OTHER POINTS WITH SAME DESIGNATION



NUMBER OF BRUSHES ON CAMS-OLDER CTS.



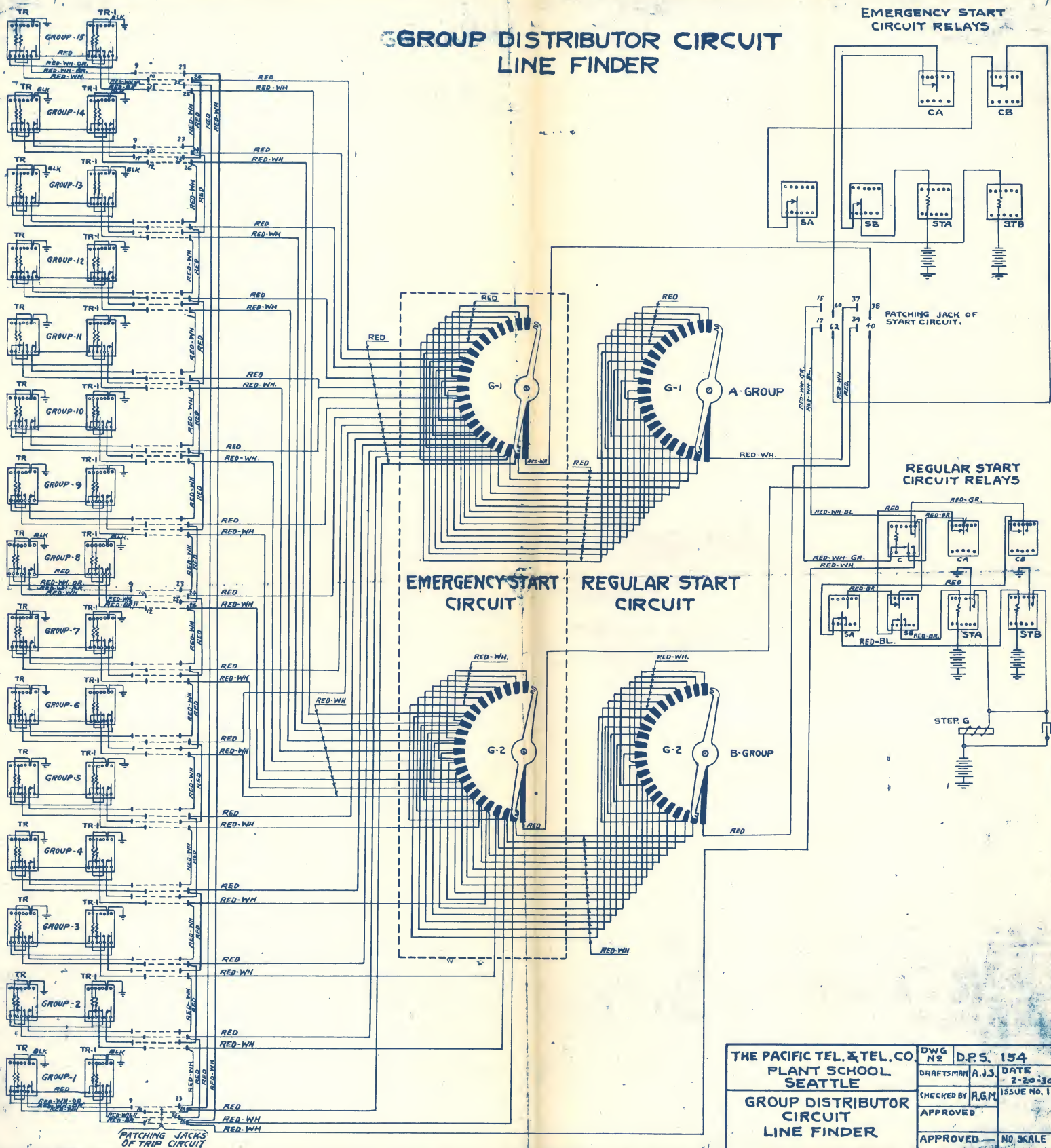
THE PACIFIC TEL. & TEL. CO.		DWG NO. D.P.S. 152	
PLANT SCHOOL SEATTLE		DRAFTSMAN A.J.S.	DATE 2-28-30
DIAL SYSTEM CONVENTIONS		CHECKED BY H.G.M.	ISSUE NO. 1
		APPROVED A.H.M.	" " 2
			" " 3





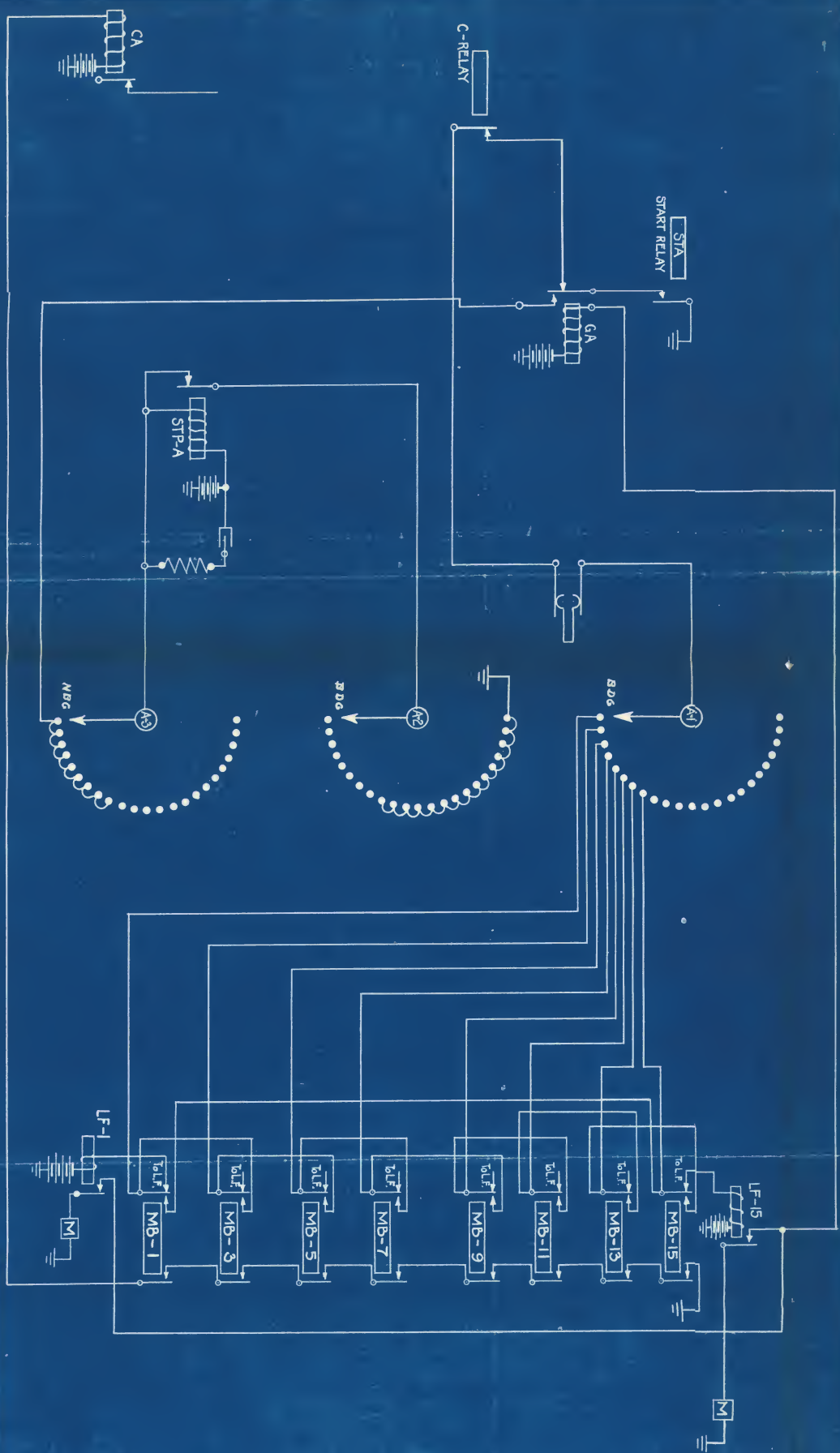
THE PACIFIC TEL. & TEL. CO. DISTRICT PLANT SCHOOL	DIV. NO. <b>D.P.S. 153</b>
FUNDAMENTAL CIRCUIT OPERATION OF LINE, TRIP, START AND DIST.	DEPARTMENT <b>10-D-34</b>
	CLASS <b>11-7-34</b>
	CHECKED BY _____
	APPROVED BY _____
	ISSUE <b>4-10-30</b>
	REV. <b>12-10-34</b>

# GROUP DISTRIBUTOR CIRCUIT LINE FINDER



THE PACIFIC TEL. & TEL. CO. PLANT SCHOOL SEATTLE  GROUP DISTRIBUTOR CIRCUIT LINE FINDER	DWG N <sup>o</sup> 154
	DRAFTSMAN A.J.J. DATE 2-20-30
	CHECKED BY A.G.M. ISSUE NO. 1
	APPROVED NO SCALE





THE PACIFIC TEL. & TEL. CO.  
 PLANT 54402.  
 SEATTLE  
 FUNDAMENTAL  
 LINE FINDER DISTRIBUTOR

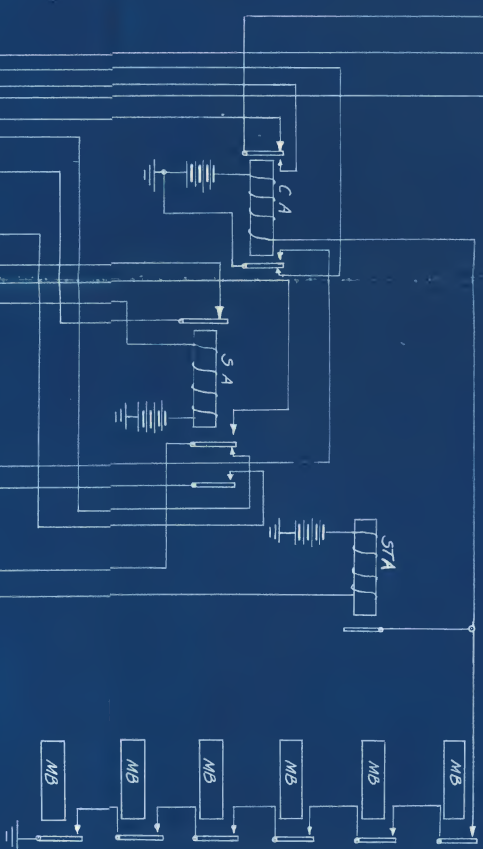
DRAWN BY: D.P.S. 155  
 CHECKED BY: J.B. 155  
 DATE: 3-27-30  
 ISSUE NO.: 2  
 APPROVED BY: J.B. 155  
 DATE: 4/1/30

# TRIP CIRCUIT GROUP-A.



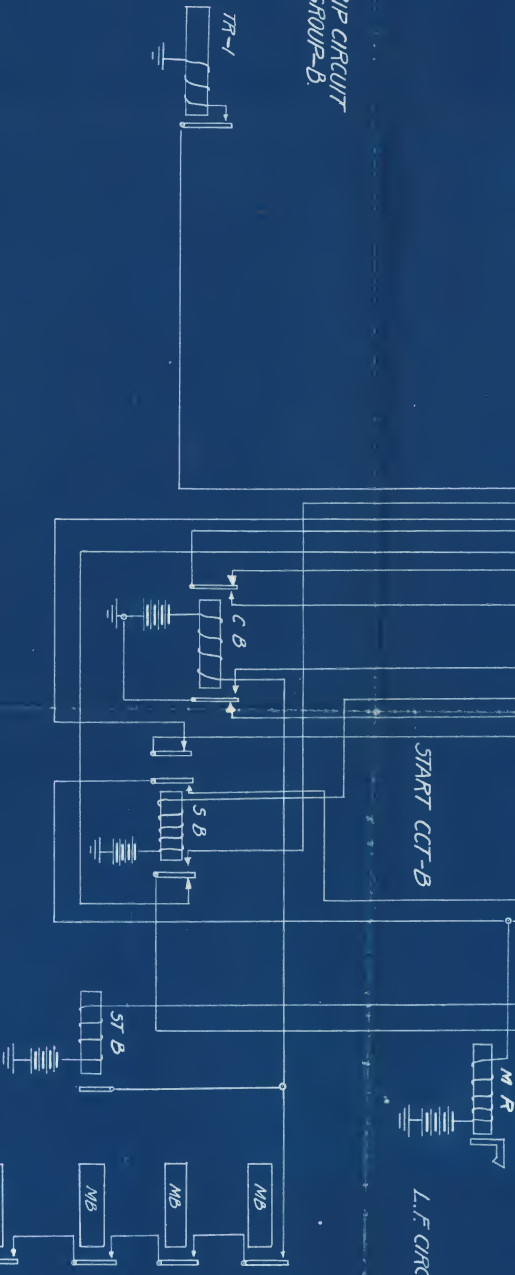
# START CIRCUIT-A

# L.F. CIRCUIT-A.



# START CCT-B

# L.F. CIRCUIT B



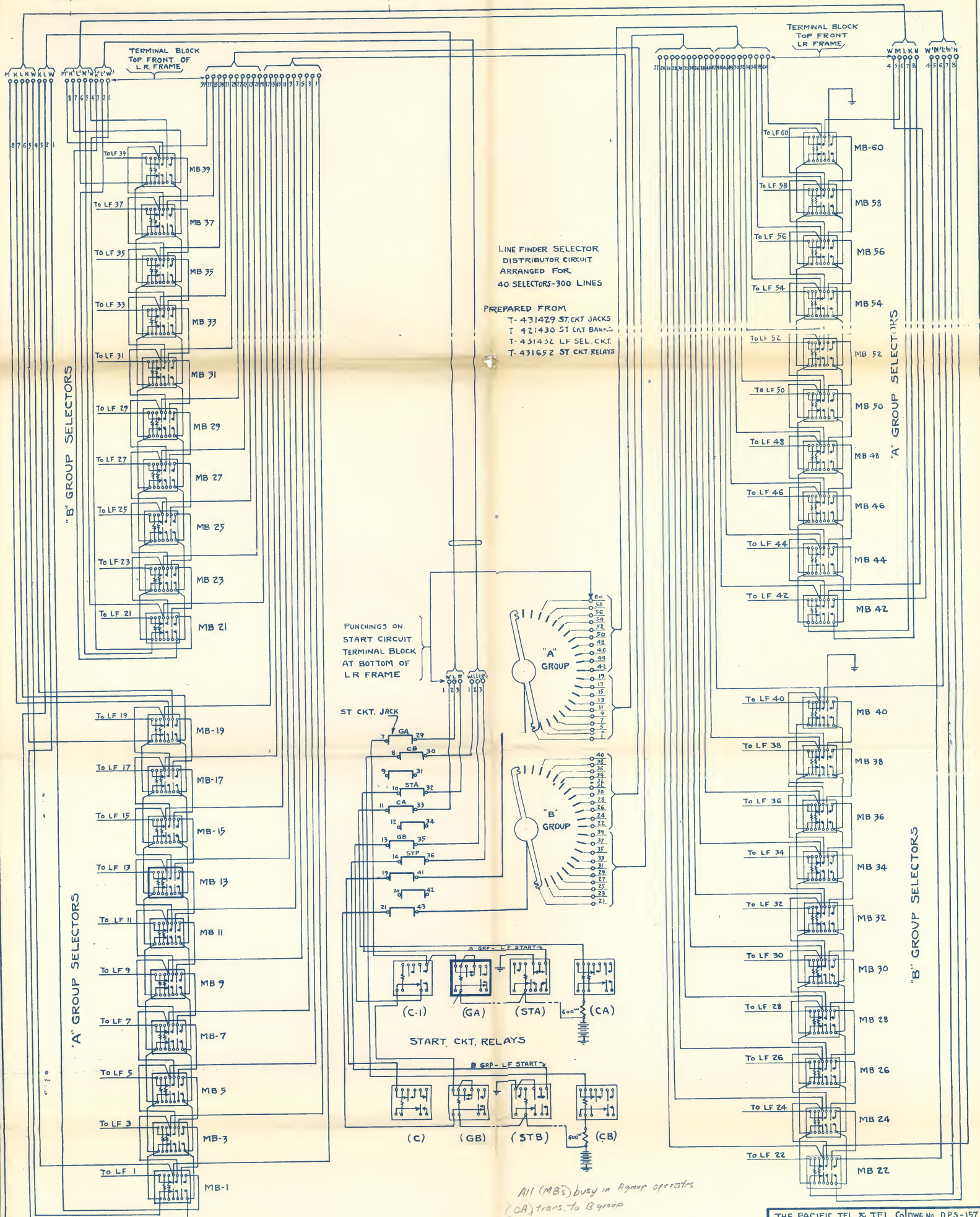
# TRIP CIRCUIT GROUP-B.



THE PACIFIC TEL. & TEL. CO.  
PLANT SCHOOL  
SEATTLE

DPS - 156  
DATE 3-10-40  
CHECKED BY K.C.M. 1580E-1  
APPROVED (Signature)  
FUNDAMENTAL START CIRCUIT  
TRANSFER FEATURE





All (MB's) busy in A group operates (CA) trans. to B group

\* Grad from Highest odd to lowest even to winding of (CA)

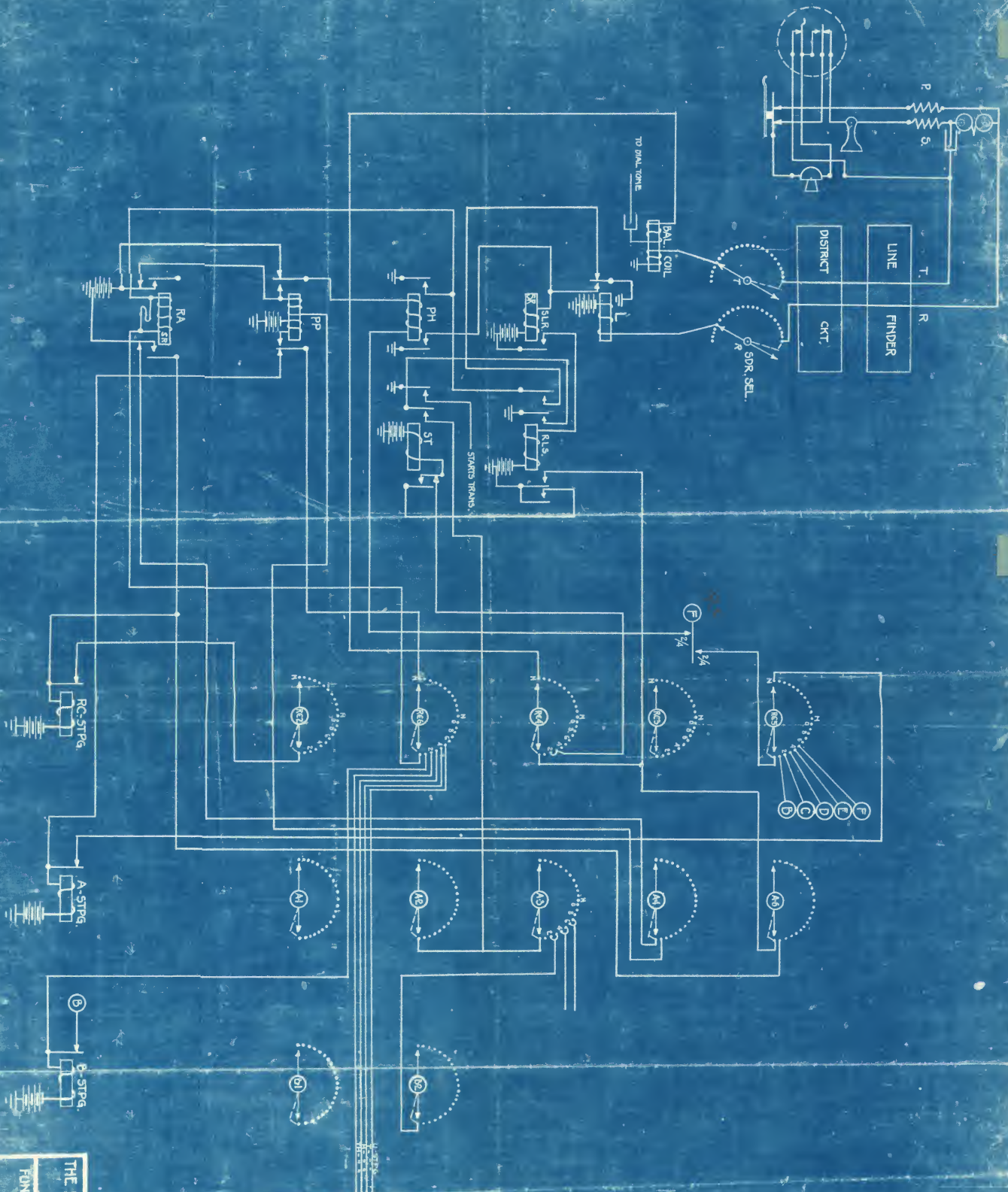
Grad from highest even to lowest odd to winding of (CB)

THE PACIFIC TEL & TEL. CO		DWG. No. D.P.S.-157	
PLANT SCHOOL-SEATTLE		DRAFTSMAN A.J.S. 8-18-37	
LINEFINDER SELECTOR DISTRIBUTOR & CHAIN CIRCUITS		ORIGINAL BY	ISS. No. 2
		APPROVED	NEW





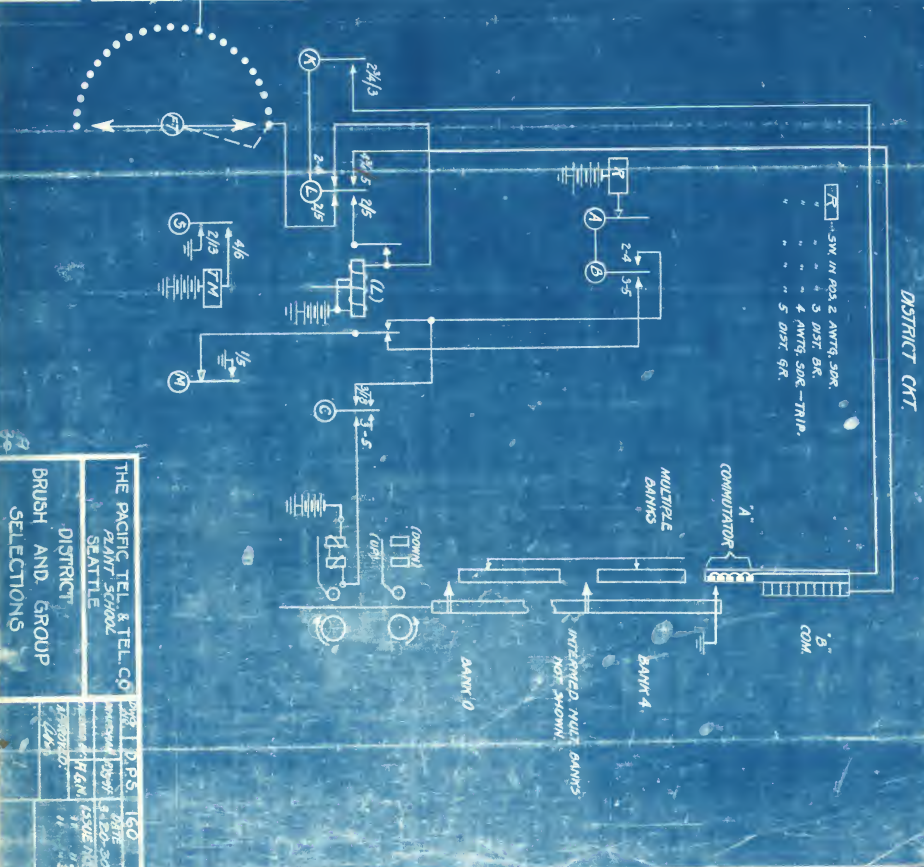




THE PACIFIC TEL. & TEL. CO.  
PLANT SCHOOL  
SEATTLE  
FUNDAMENTAL REGISTRATION  
OF  
DIAL PULSES

DATE: 10/10/20  
BY: [Signature]  
CHECKED: [Signature]  
APPROVED: [Signature]

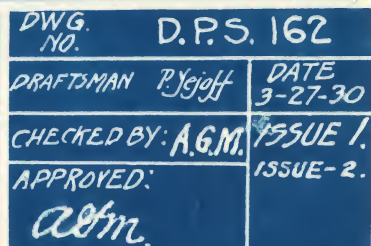








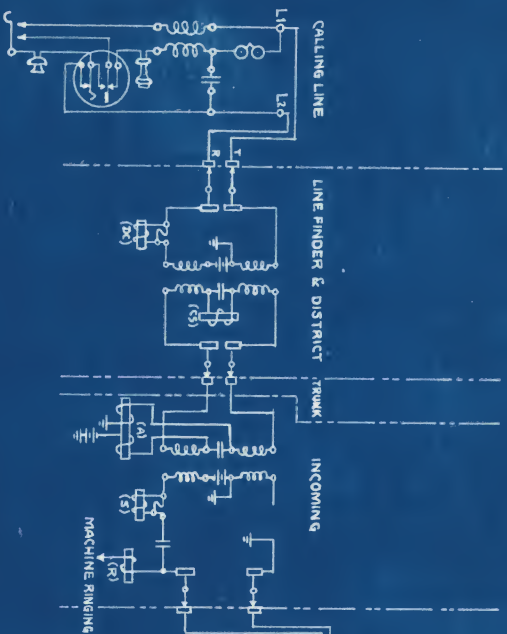
0400	0499	0900	0999
0300	0399	0800	0899
0200	0299	0700	0799
0100	0199	0600	0699
0000	0099	0500	0599



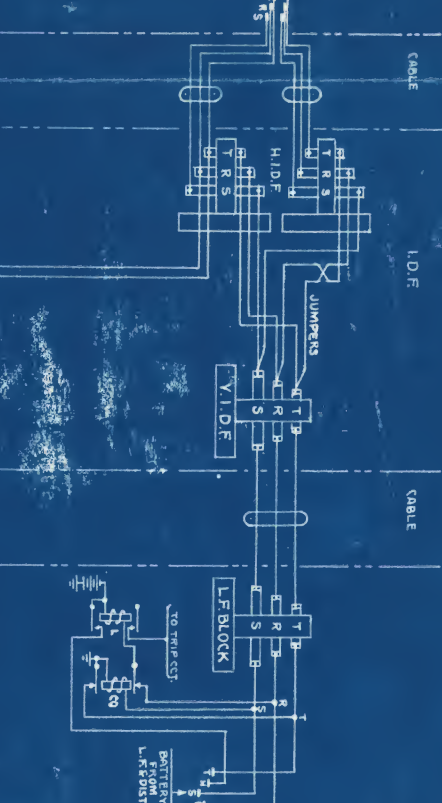




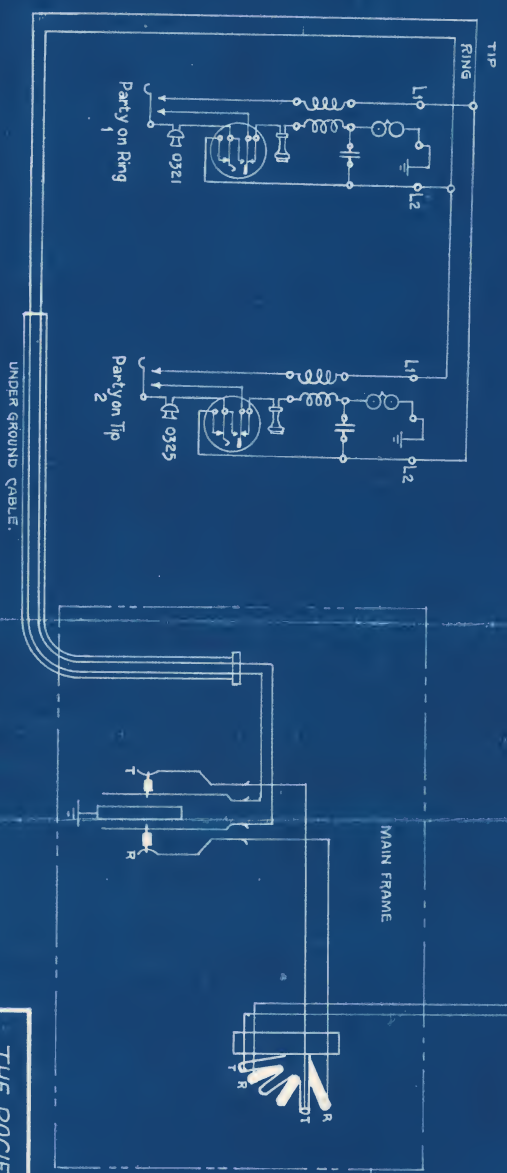




FINAL FRAME			
0499	0400	0399	0398
0397	0396	0395	0394
0393	0392	0391	0390
0389	0388	0387	0386
0385	0384	0383	0382
0381	0380	0379	0378
0377	0376	0375	0374
0373	0372	0371	0370
0369	0368	0367	0366
0365	0364	0363	0362
0361	0360	0359	0358
0357	0356	0355	0354
0353	0352	0351	0350
0349	0348	0347	0346
0345	0344	0343	0342
0341	0340	0339	0338
0337	0336	0335	0334
0333	0332	0331	0330
0329	0328	0327	0326
0325	0324	0323	0322
0321	0320	0319	0318
0317	0316	0315	0314
0313	0312	0311	0310
0309	0308	0307	0306
0305	0304	0303	0302
0301	0300	0299	0298
0297	0296	0295	0294
0293	0292	0291	0290
0289	0288	0287	0286
0285	0284	0283	0282
0281	0280	0279	0278
0277	0276	0275	0274
0273	0272	0271	0270
0269	0268	0267	0266
0265	0264	0263	0262
0261	0260	0259	0258
0257	0256	0255	0254
0253	0252	0251	0250
0249	0248	0247	0246
0245	0244	0243	0242
0241	0240	0239	0238
0237	0236	0235	0234
0233	0232	0231	0230
0229	0228	0227	0226
0225	0224	0223	0222
0221	0220	0219	0218
0217	0216	0215	0214
0213	0212	0211	0210
0209	0208	0207	0206
0205	0204	0203	0202
0201	0200	0199	0198
0197	0196	0195	0194
0193	0192	0191	0190
0189	0188	0187	0186
0185	0184	0183	0182
0181	0180	0179	0178
0177	0176	0175	0174
0173	0172	0171	0170
0169	0168	0167	0166
0165	0164	0163	0162
0161	0160	0159	0158
0157	0156	0155	0154
0153	0152	0151	0150
0149	0148	0147	0146
0145	0144	0143	0142
0141	0140	0139	0138
0137	0136	0135	0134
0133	0132	0131	0130
0129	0128	0127	0126
0125	0124	0123	0122
0121	0120	0119	0118
0117	0116	0115	0114
0113	0112	0111	0110
0109	0108	0107	0106
0105	0104	0103	0102
0101	0100	0099	0098
0097	0096	0095	0094
0093	0092	0091	0090
0089	0088	0087	0086
0085	0084	0083	0082
0081	0080	0079	0078
0077	0076	0075	0074
0073	0072	0071	0070
0069	0068	0067	0066
0065	0064	0063	0062
0061	0060	0059	0058
0057	0056	0055	0054
0053	0052	0051	0050
0049	0048	0047	0046
0045	0044	0043	0042
0041	0040	0039	0038
0037	0036	0035	0034
0033	0032	0031	0030
0029	0028	0027	0026
0025	0024	0023	0022
0021	0020	0019	0018
0017	0016	0015	0014
0013	0012	0011	0010
0009	0008	0007	0006
0005	0004	0003	0002
0001	0000		

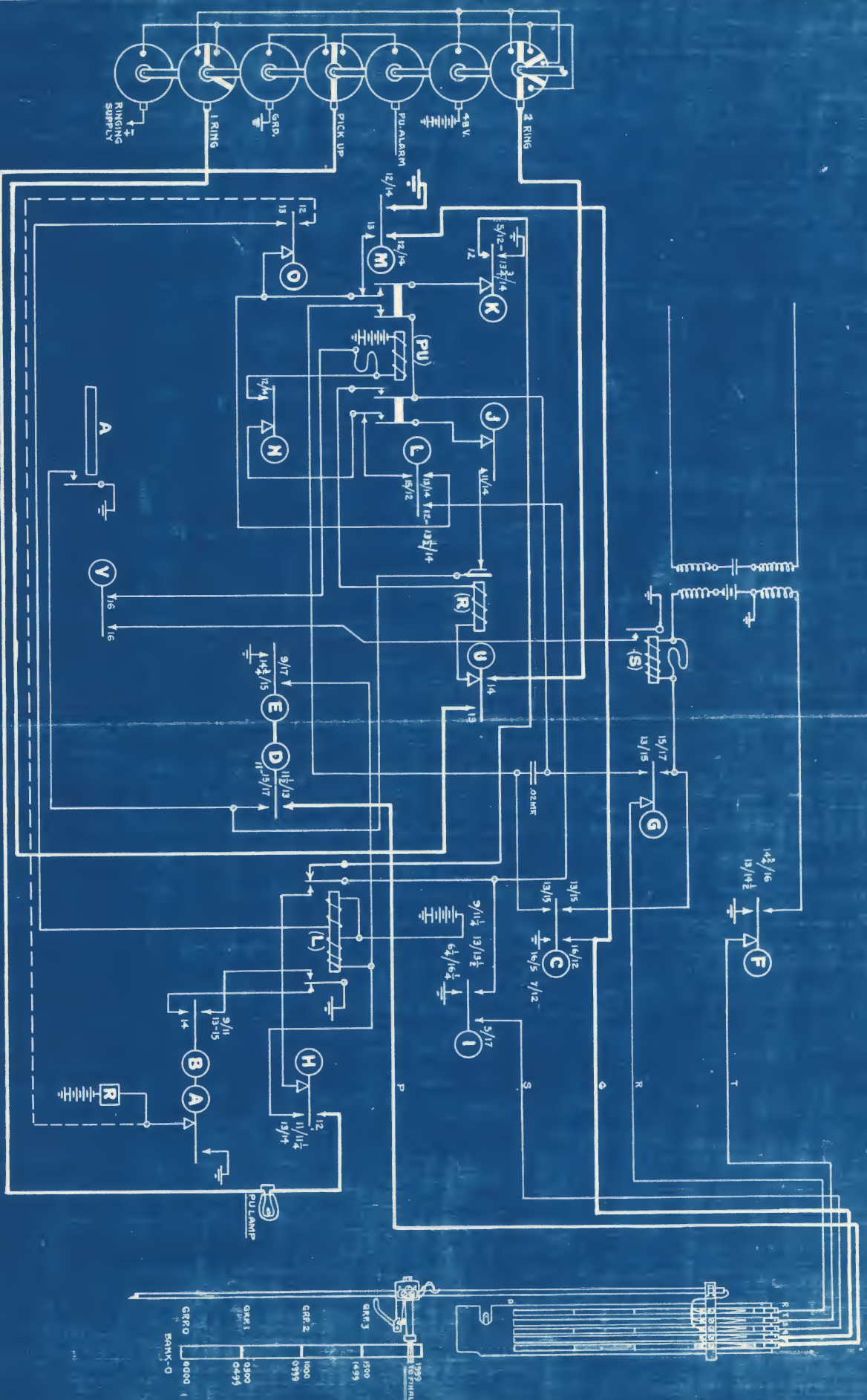


LINE FINDER FRAME											
1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12



THE PACIFIC TEL. & TEL. CO.		DWG. NO.	D.P.S. 164
SEATTLE PLANT SCHOOL.		DRAFTSMAN	CES.
RINGING ON A TWO PARTY LINE.		CHECKED BY	AGM.
		APPROVED BY	25th
		ISSUE No. 1	





POS. 12 PICK UP  
 POS. 13 ONE BELL RING  
 POS. 14 TWO " "  
 POS. 15 AWAIT (L)  
 POS. 16 TALKING

THE PACIFIC TEL. & TEL. CO.  
 SEATTLE PLANT SCHOOL.

ONE & TWO BELL  
 RINGING

DWG. NO. D.P.S. 165

DRAFTSMAN. C.E.S. 6-17-30

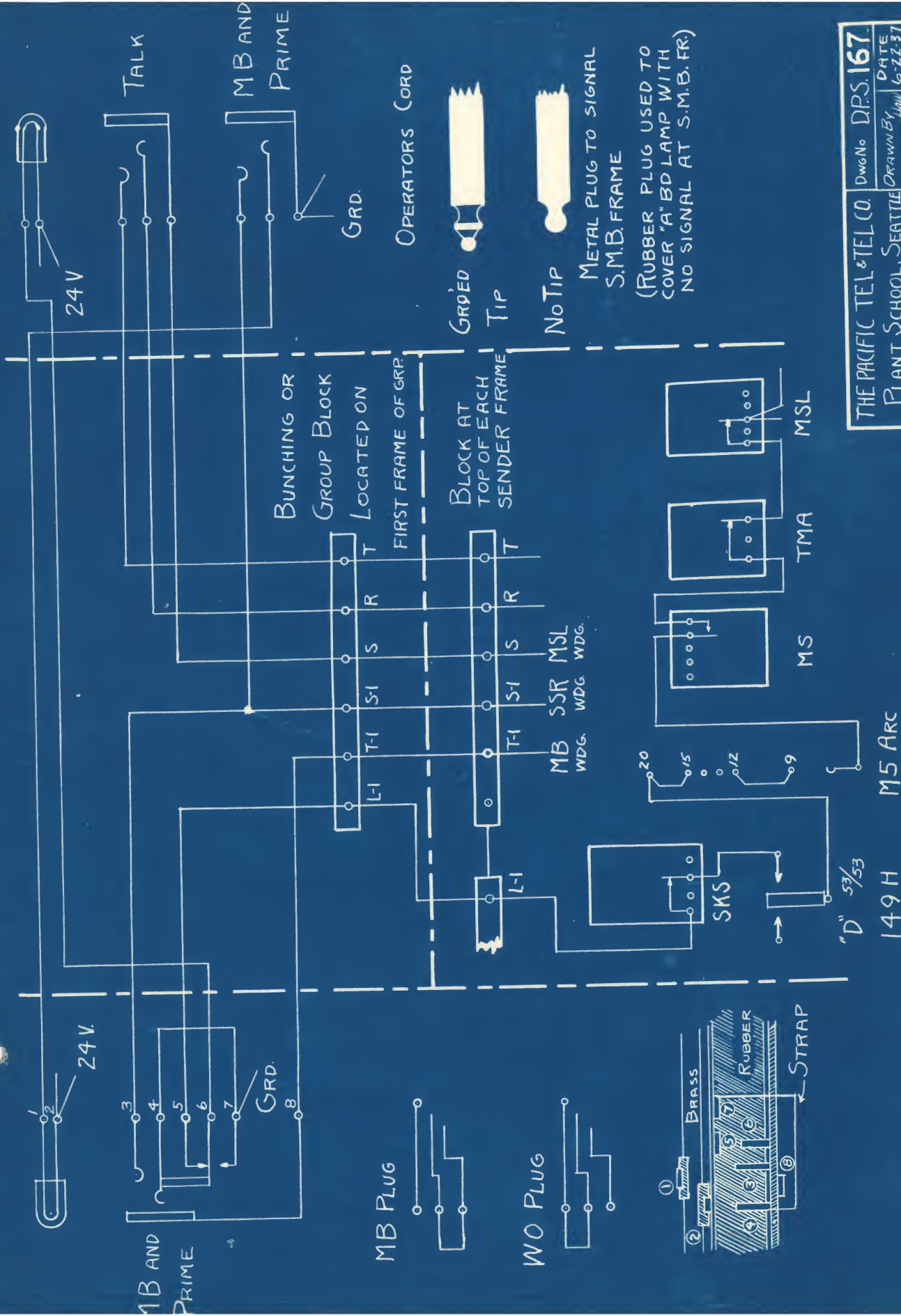
CHECKED BY R.E.M.

APPROVED BY

ISSUE 1.  
 1908-2.  
 ISSUES

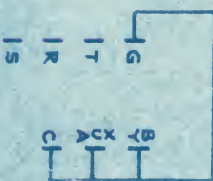
SDR. M.B. FRAME

M.S. A.B.D.



THE PACIFIC TEL & TEL CO. PLANT SCHOOL, SEATTLE SENDER ALARM "A" B.D. & S.M.B. B.D.	Dwg No	DPS. 167
	DRAWN BY	DATE
	CHECKED BY	6-22-37
	APPROVED	ISSUE /





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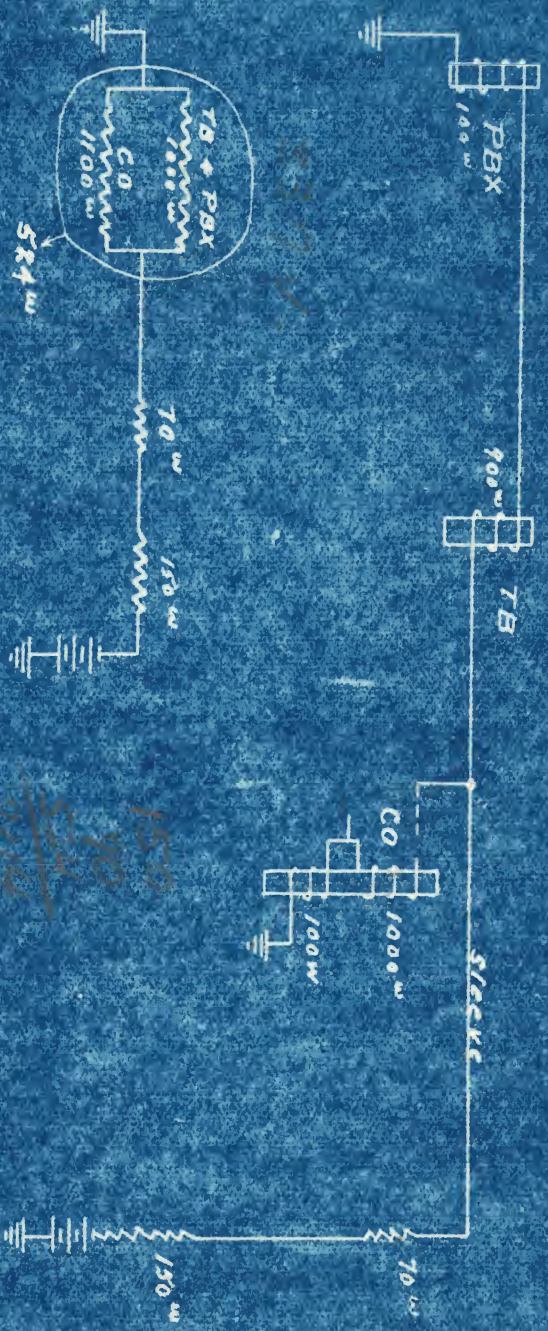
Translator 1121

Translator 1122

THE PACIFIC TEL. & TEL. CO.	
PLANT SCHOOL	
SEATTLE	
DATE	NOV 10 1953
APPROVED	ISSUED
APPROVED	1



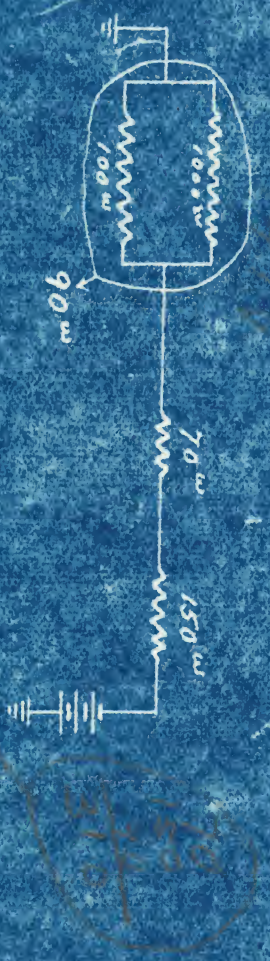
PBX Op. - .024 Non. - .022 Milli.  
 T.B. Op. - .0045 milli.



1500  
 900  
 524  
 724

Current flow to grd. =  $\frac{48}{744} = .064$  milli

$$\frac{524}{1000} \times .064 = .0335 \text{ milli thru PBX \& TB.}$$



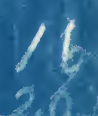
1000  
 100  
 1100  
 210

Current flow to grd. =  $\frac{48}{310} = .154$  milli

$$\frac{90}{1000} \times .154 = .014 \text{ milli thru PBX \& TB.}$$

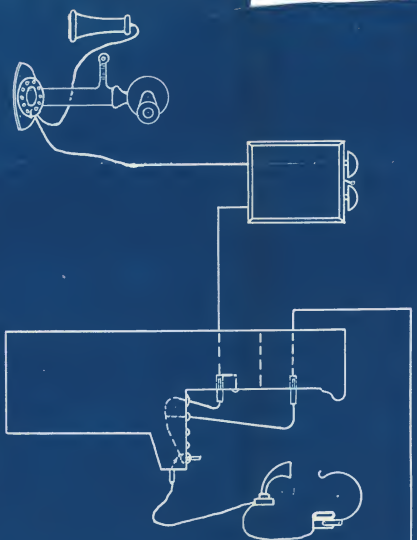
MARGINAL FEATURE  
 OF  
 P.B.X RELAY.  
 L.E.B.



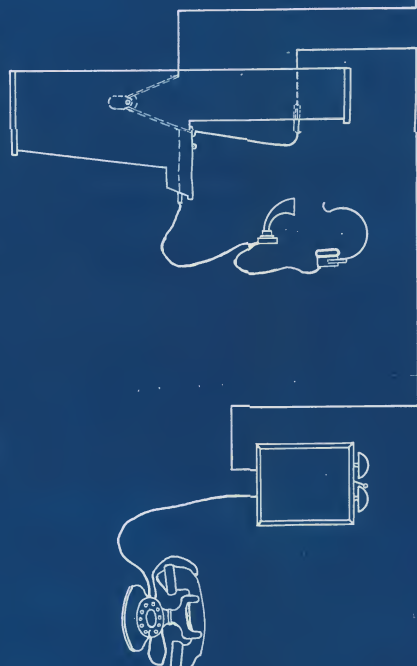
16  
200



# "A" BOARD

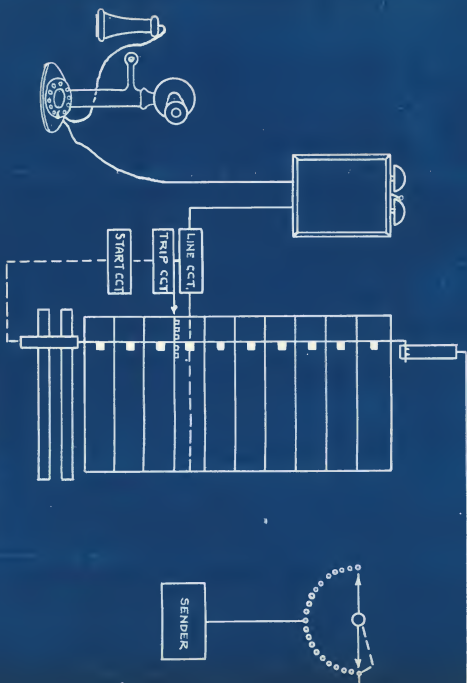


# "B" BOARD

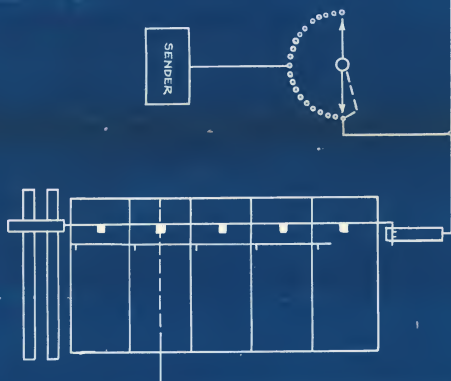


TO OTHER FINAL FRAMES

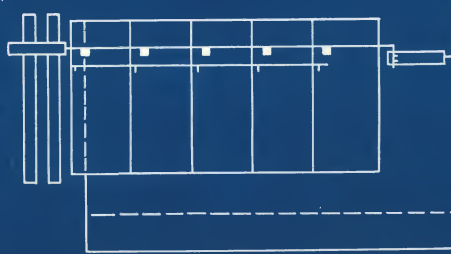
# LINE FINDER FRAME



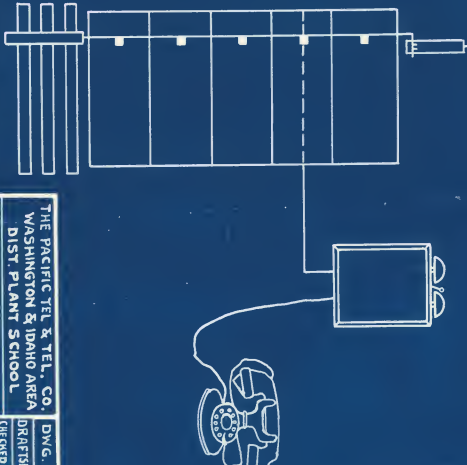
# DISTRICT FRAME



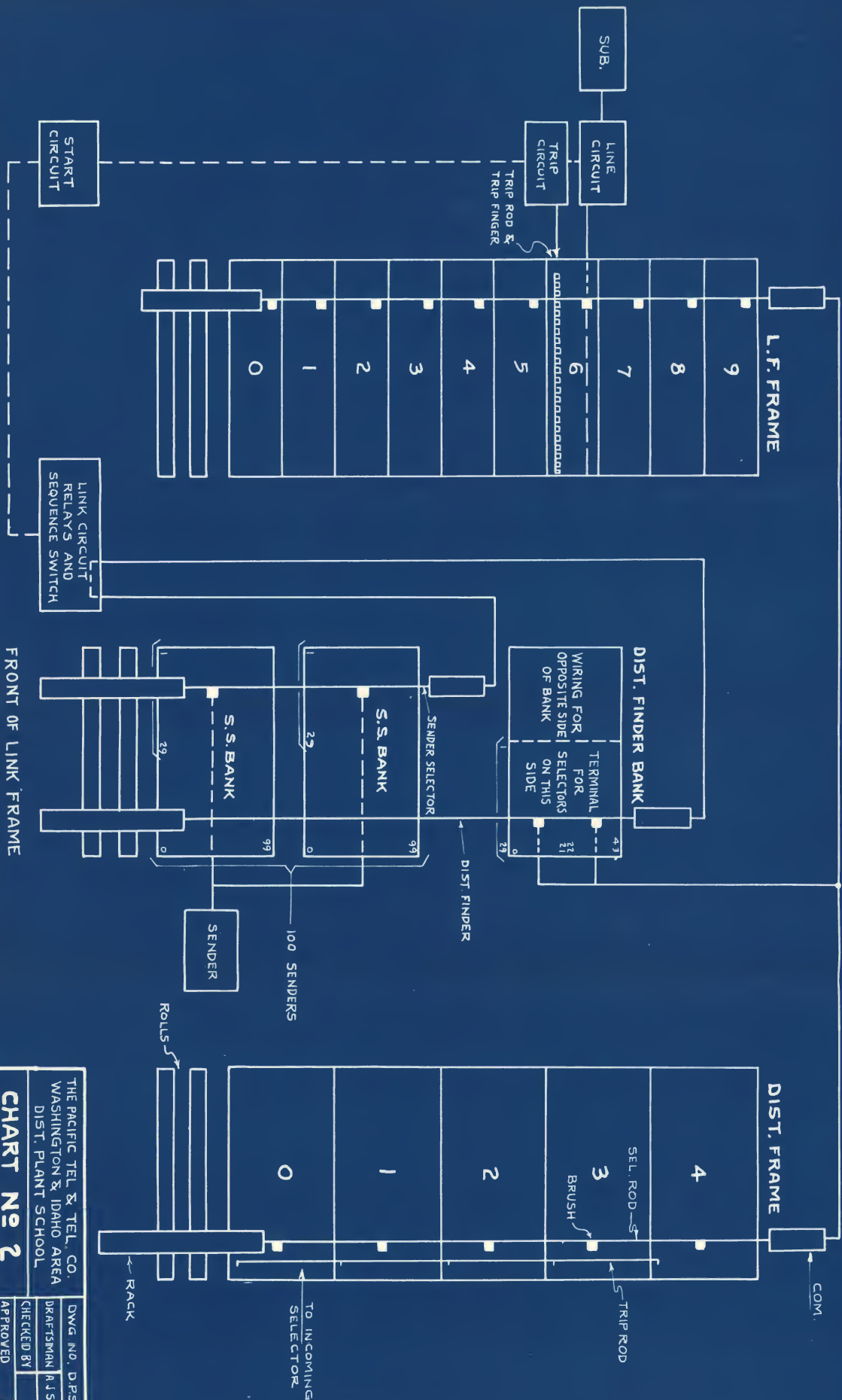
# INCOMING FRAME



# FINAL FRAME



THE PACIFIC TEL & TEL. CO.	
WASHINGTON & IDAHO AREA	
DIST. PLANT SCHOOL	
CHART No 1	DWG. No. D.P.S. 173
APPROVED	DRAFTSMAN (A.S.) 3-1-37
	ISSUE No 1



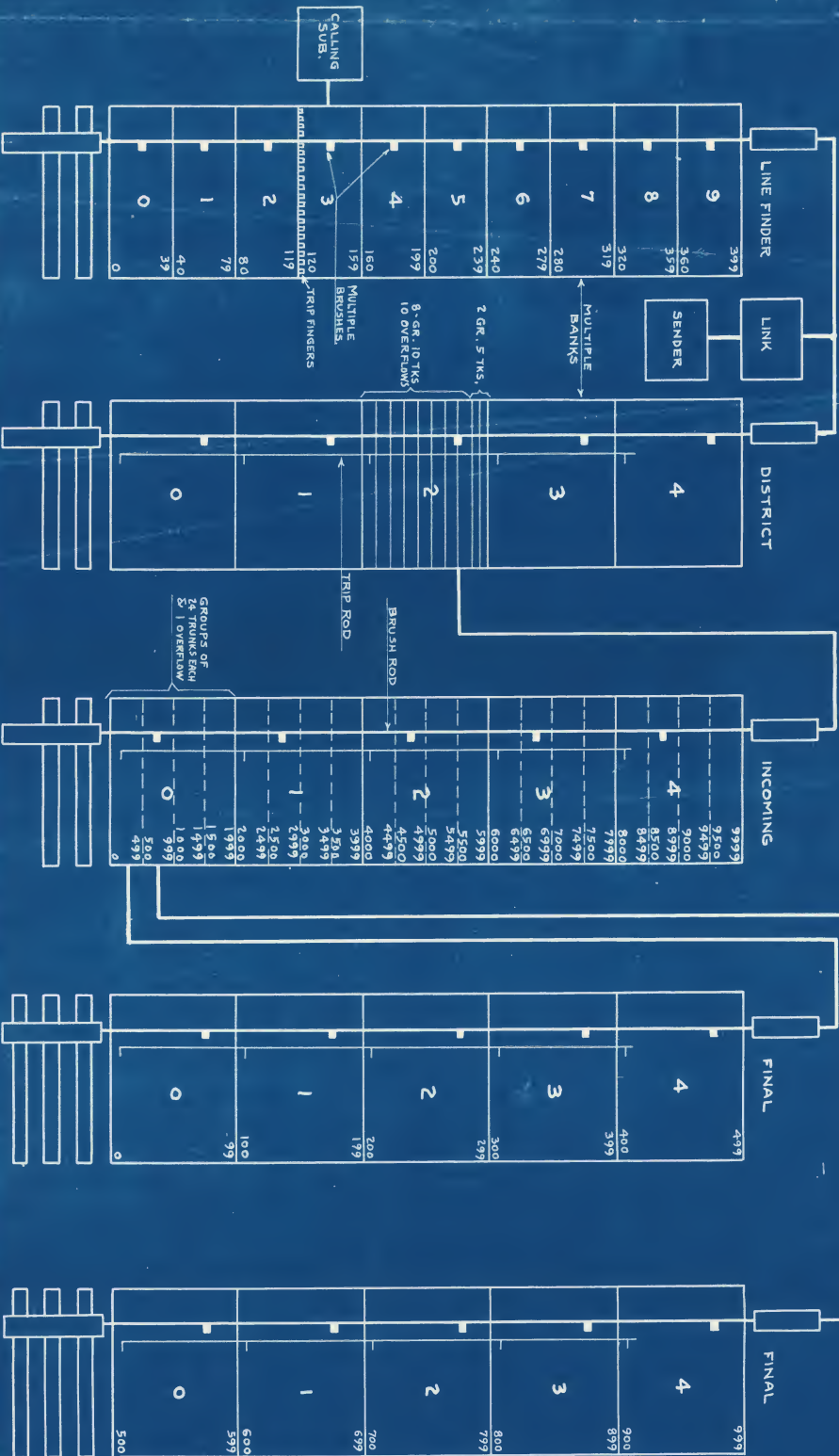
THE PACIFIC TEL. & TEL. CO.  
WASHINGTON & IDAHO AREA  
DIST. PLANT SCHOOL

**CHART No 2**

DWG. NO. D.P.S. 174	3-1-37
DRAFTSMAN R.J.S.	ISSUE No 1
CHECKED BY	
APPROVED	



# SEQUENCE OF FRAMES



GROUPING OF INCOMING TRUNK MULTIPLE & SUBSCRIBERS MULTIPLE

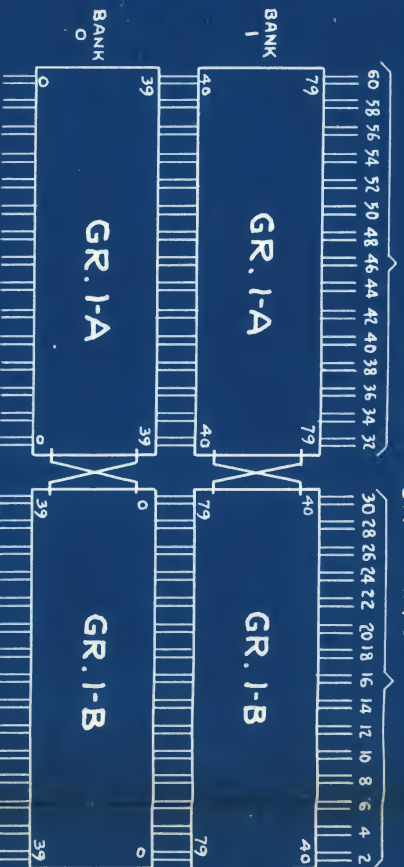
THE PACIFIC TEL. & TEL. CO.  
WASHINGTON & IDAHO AREA  
DIST. PLANT SCHOOL

CHART No 3

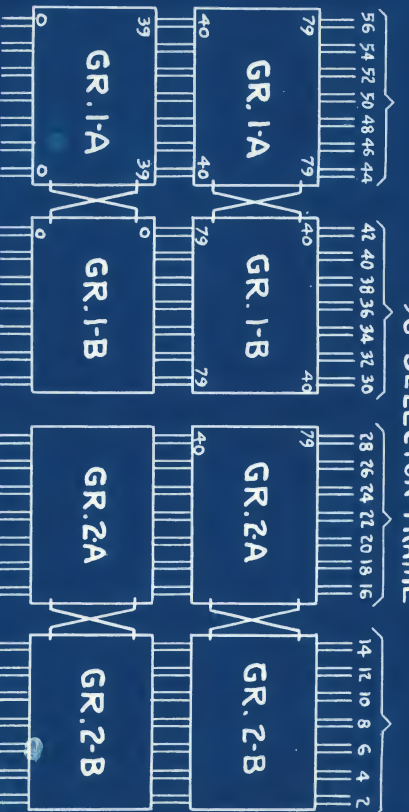
DWG. No. DRS. 175  
DRAFTSMAN A.J. 10-1-36  
CHECKED BY  
APPROVED

# ARRANGEMENT OF SUB. GROUPS AND SLIP WIRING ON THE VARIOUS TYPE LINE FINDER BANKS

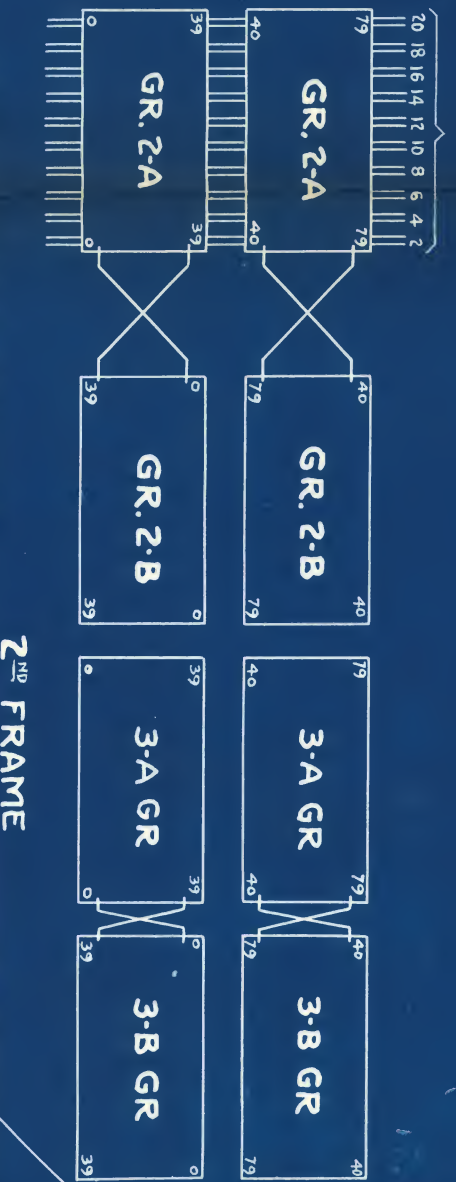
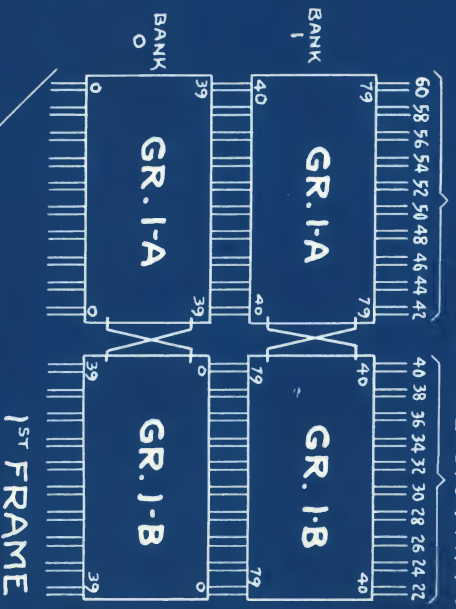
**400 LINE FRAME**  
30 SELECTORS FOR EACH SUB-GROUP  
15 ON EACH SIDE OF FRAME  
60 SELECTOR FRAME



**800 LINE FRAME**  
14 SELECTORS FOR EACH SUB-GROUP  
7 ON EACH SIDE OF FRAME  
56 SELECTOR FRAME



20 SELECTORS FOR EACH SUB-GROUP  
10 ON EACH SIDE OF FRAME  
60 SELECTOR FRAME



1200 LINES 2 FRAMES

**2<sup>ND</sup> FRAME**

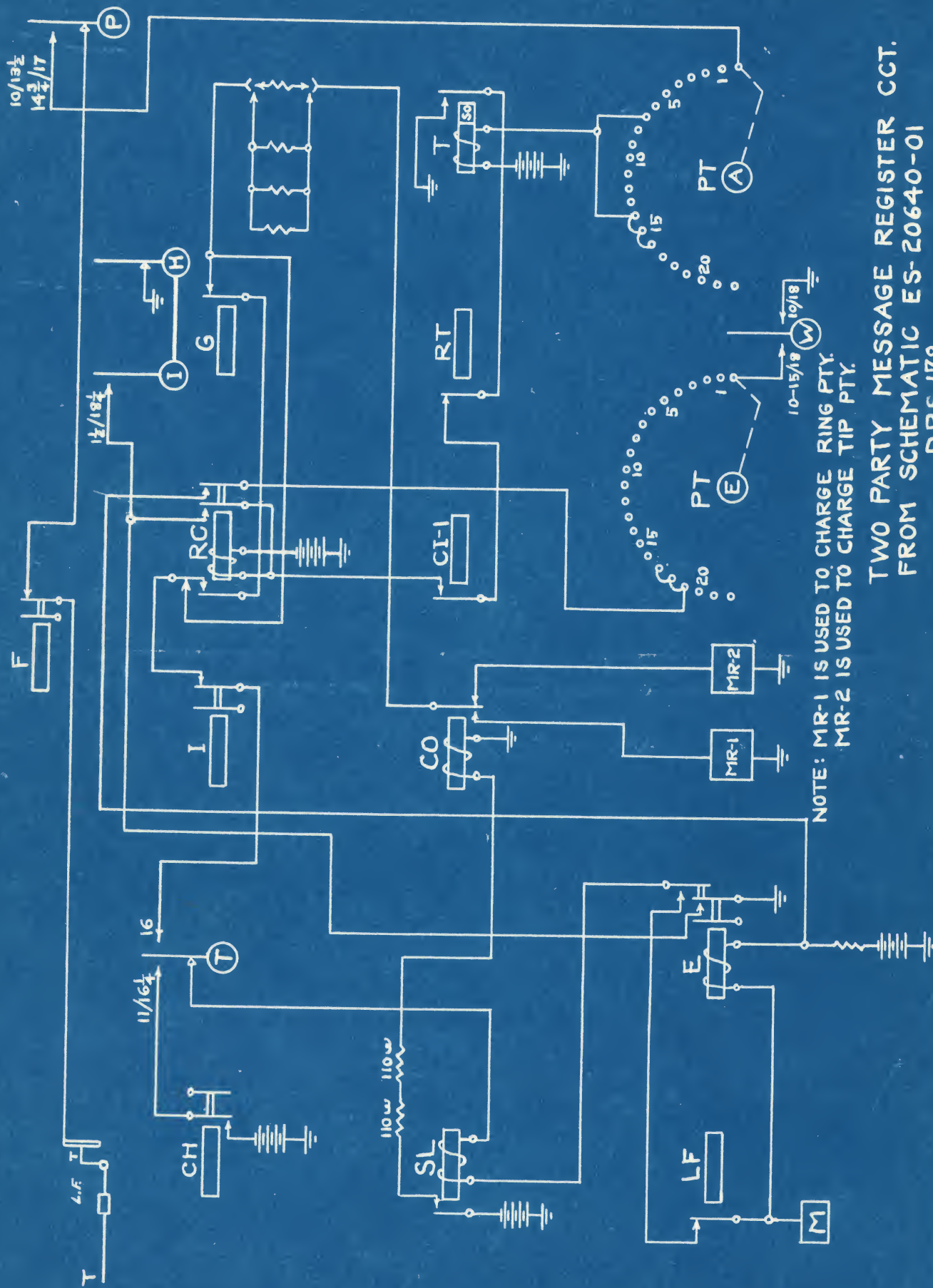
THE PACIFIC TEL. & TEL. CO.  
WASHINGTON & IDAHO AREA  
DIST. PLANT SCHOOL

CHART No 5

DWG. No. D.R.S.-177  
DRAFTSMAN A.J.S. 8-17-36  
CHECKED BY  
APPROVED

EACH LINE CIRCUIT  
REQUIRES 4 TERMS.  
TIP, RING, SLEEVE  
AND GROUND.  
THERE ARE 40 LINE  
CIRCUITS IN EACH  
BANK AND 10 BANKS  
PER FRAME.





TWO PARTY MESSAGE REGISTER CCT.  
FROM SCHEMATIC ES-20640-01  
D.P.S. 179

Drawn by J.A.B. - Checked by D.V.





Fig.1



Check brush intrusion 2.08

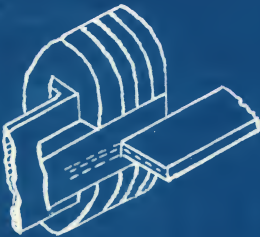
Fig.2



Horizontal centering 2.09

Tip and ring spring clearance 2.10

Fig.6



Non-bridging sleeve location (fig.6) 2.14

Fig.3

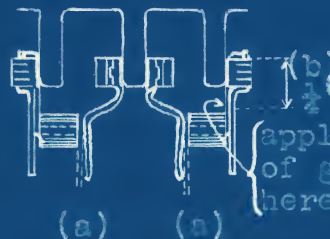


Parallelism of contacting surfaces 2.11

Brush spring tension see fig 4b 2.12

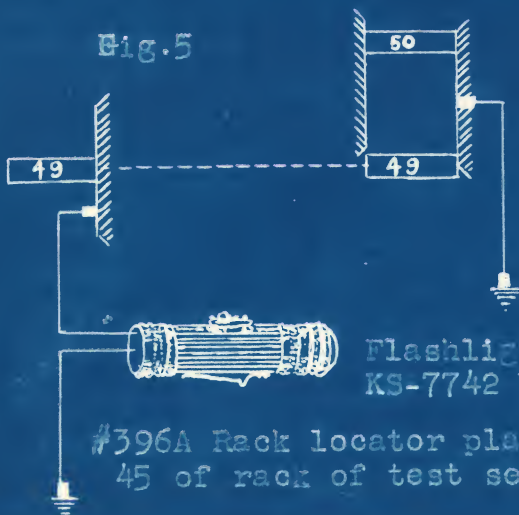
Brush stud gap see fig 4a 2.07

Fig.4



Bridging sleeve spring location, fig 5 illustrates method of checking lower spring. Check higher sleeve spring location on terminals 52 &amp; 53 here 2.13

Fig.5



Flashlight equipped with KS-7742 bottom cap

#396A Rack locator placed in notch 45 of rack of test selector

Tip and ring spring location 2.15

Point of contact between trip armature extension and rotate lever 2.16

Multiple brush reset 2.28(b)








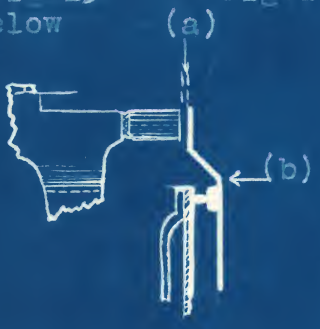
D.P.S.

THE PACIFIC TEL.  
and TEL. CO.  
SEATTLE PLANT SCHDWG  
NO. 182DRAFTSMAN ARF  
(12-17-41)

CHECKED DV

APPROVED

Multiple brush  
adjustments  
Per BSP 4446.006  
issue 2B  
addendum 1D

Fig. 1		Align rotor brush tips	2.05
Fig. 2		Center brushes on terminal	2.06
Fig. 3		Align rotor brushes	2.07
		Feeder brush adjustments	2.08
Fig. 4		Rotor brush to ratchet wheel and driving arm clearance	2.15
Fig. 5		Rotor brush tension	2.10
Fig. 6		Rotor brush prong contact	2.11
Fig. 7		Toeing of bridging brushes	2.12
Fig. 8		Heel spacing fig. 8	2.13
Fig. 9		Driving spring tension, measure at point "b"	2.16
Fig. 10		Armature back stop position	2.17
Fig. 11		Retaining pawl tension and position	2.18
Fig. 12		Armature air gap	2.19
Fig. 13 below		(Fig. 9a) Driving pawl tension and position	2.21

Int. spring tension (b)	2.20
Pull test (see fig 9c)	2.22
Step test (see fig 9b)	2.23
Speed test (no fig)	2.24
High and low voltage	2.25
Stud gap (fig 13a)	2.27
Int. contact test	2.26

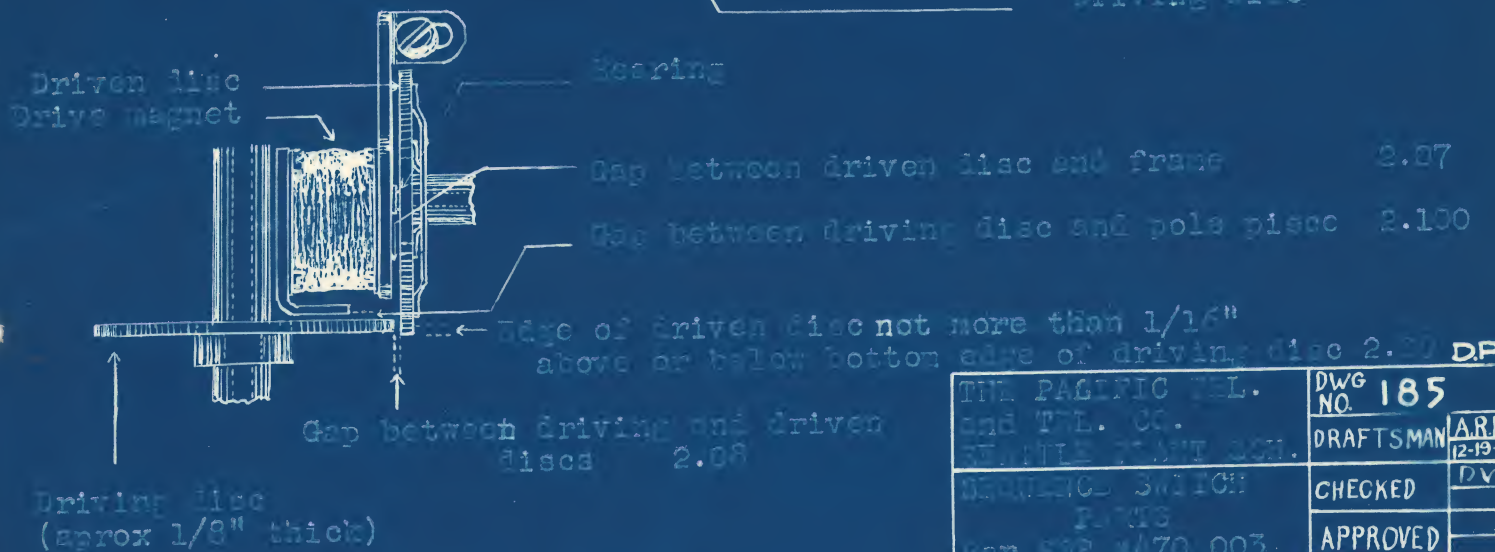
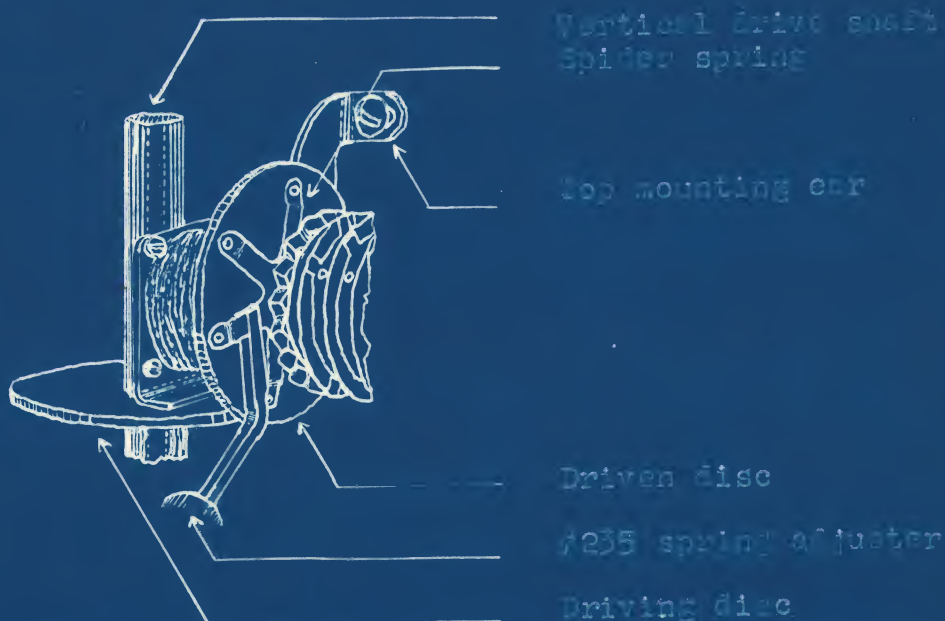
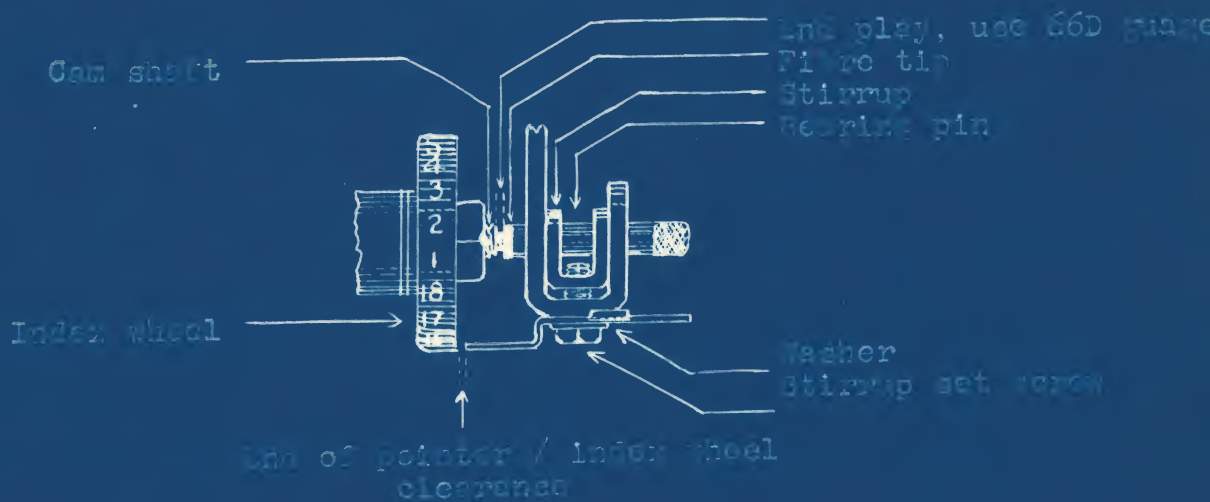
THE PACIFIC TEL.  
and TEL. CO.  
PLANT SCHOOL

ADJUSTMENTS TO  
200 type SELECTORS  
per BSP A468.002  
issue 3D  
addendum 2D

DWG NO. 184	ARF. 12-20-41
DRAFTSMAN	D.V. 12-22-41
CHECKED	
APPROVED	

D.P.S.





THE PACIFIC TEL.  
and TEL. CO.  
SEATTLE PLANT 301.  
SEQUENCE SWITCH  
PARTS  
Per ESP 4470 003

DWG NO.	185
DRAFTSMAN	ARR 12-19
CHECKED	DV
APPROVED	



Remove and straighten rack,  
clean if necessary.  
(BSP A448.002, 2.01, 2.02)



Clutch held firmly against top  
locating plate (BSP A448.002, 2.05)



at "0" terminal



at terminal "99"

O, T, R, S Brushes shall rest on metal with  
rack in "0" and "99"

O commutator



equal

Vertical position of springs  
2.08

A commutator



.010"

C commutator



B commutator



.010"



35grams each



45grams



45grams



45grams

Contact pressure 2.09

Check all multiple brushes  
for T, R, S clearance  
(BSP A446.006, 2.09, 2.10)

D.P.S.

THE PACIFIC TEL and TEL. CO. SEATTLE PLANT SCH	DWG No. 186	
	DRAFTSMAN	A.R.F. 12-16-41
	CHECKED	DV 12-16-41
	APPROVED	
Adjustments to 3D commutators Per BSP A449.002 issue 2D		



Fig. 1



Fig. 2

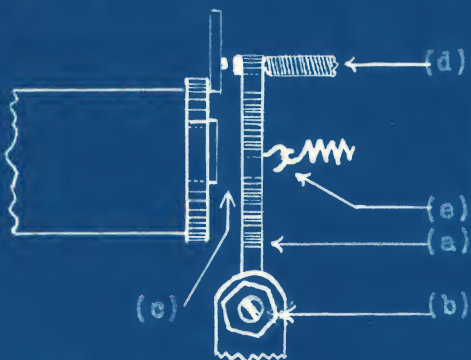


Fig. 3

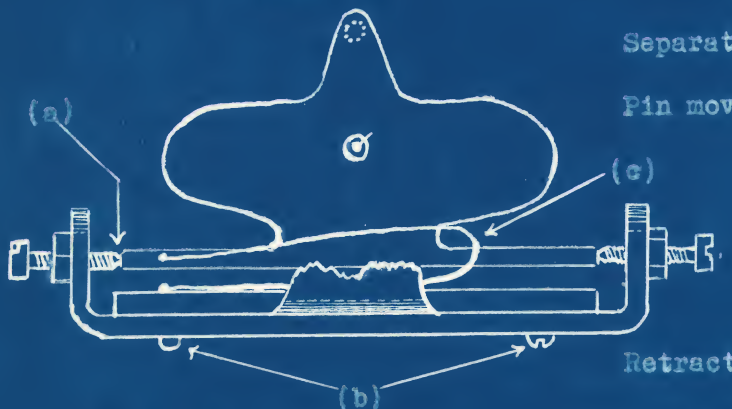


Fig. 4



Check relay mounting

2.02

Dismount armature (fig. 2,a)

Clean pivot bearings (fig. 3,a) with toothpick,  
the broad end of which has been cut with  
pliers as shown, (fig. 1).

Remount armature

Align contacts horizontally (fig. 4,a)

2.04

Check armature movement

2.09

Check tightness of lock nuts (fig. 2,b)

2.05

Align contacts vertically (fig. 4,b)

2.04

Armature must be parallel to core when operated.

Check unoperated armature air gap (fig. 2,c)

use 77B guage

2.10

Adjust unoperated armature air gap by means  
of back stop screw (fig. 2,d) and armature  
bracket screws (fig. 3,b).

Separation between armature and back stop

2.11

Pin movement (fig. 2,e)

2.07

Retractable spring and frame clearance

2.08

Bonding strap position (fig. 3,c)

2.06

Electrical requirements

2.12

D.P.S

THE PACIFIC TEL. and  
TEL. CO.  
SEATTLE PLANT SCHOOL

DWG  
NO. 187

Drawn by A.R.F.  
1-5-42

Adjustment of  
207 type relays  
Per BSP A460.024  
issue 2D  
addendum 1D

Checked  
Approved

PV

Fig. 1

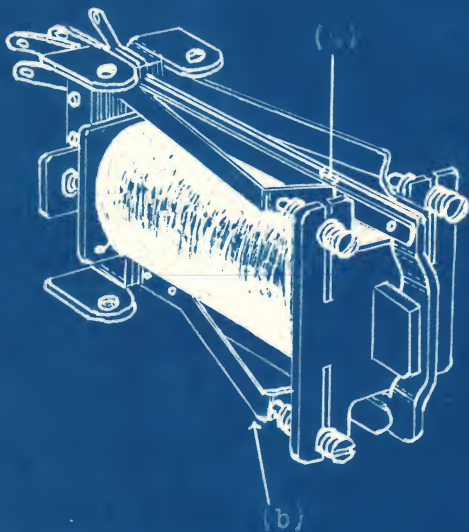
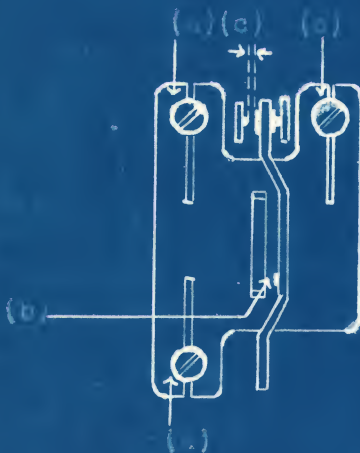


Fig. 2



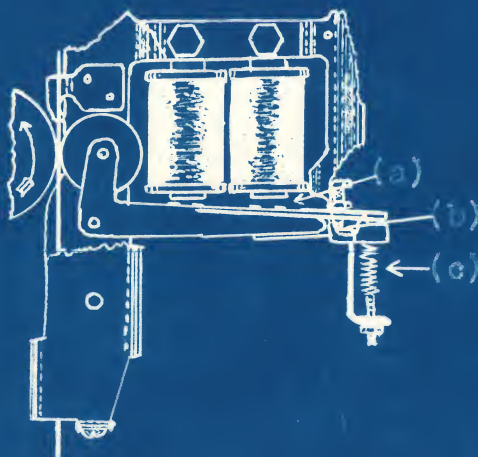
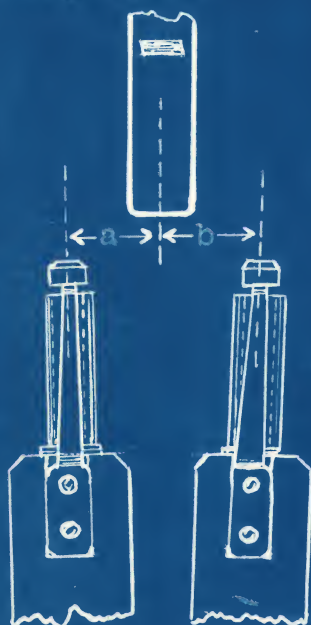
Check relay mounting	2.02
Check cover clearance	2.03
Check cover cap	2.04
Straightness of springs	2.15
Clearance between armature and flexible contact spring (fig. 1, a)	2.17
Armature tension spring position (fig. 1, b)	2.20
Contact alignment	2.05
Flexible front contact spring position (fig. 1 c)	2.11
Tightness of adjusting screws (fig. 2, a)	2.06
Armature travel (measure at point "b", fig. 2)	2.14
Contact separation (fig. 2, c)	2.13
Contact follow	2.10
Minimum front contact make	2.12
Electrical requirements	2.19

D.P.S

THE PACIFIC TEL. AND TEL. CO. SEATTLE PLANT SCHOOL  Adjustments to "B" type relays per BOP A461.002 issue 2D addendum 2D	DWG NO.	188
	DRAFTSMAN	A.R.F. 12-31-41
	CHECKED	D.V.
	APPROVED	



Fig.2  
(distances a&b must  
be within 1/16" of  
being equal)



Check rack tongue tension 2.01  
Check rack straightness 2.02  
Clutch location 2.05a  
Clutch position 2.05b  
Clutch alignment (fig.2) 2.05c

Adjust clearance between bent  
portion of trip armature and  
magnet core (fig.1a) 2.07  
(use #81 gauge)  
Adjust clearance between non-  
freezing disc and core nearer  
fulcrum (fig.1b) 2.08

Clearance between trip armature  
extension and rack (fig.1c) 2.09  
Clearance between trip armature  
extension and multiple brush  
frame (fig.1d) 2.10  
Trip magnet operate test 2.11

Up drive core gap (fig.3a) 2.12  
(use #84B gauge)  
Operated up drive core gap  
(fig.3a) (use #82B gauge) 2.13  
Gap between adjusting screw and  
roller arm, magnet fully  
operated (fig.3b) (use #80B) 2.14

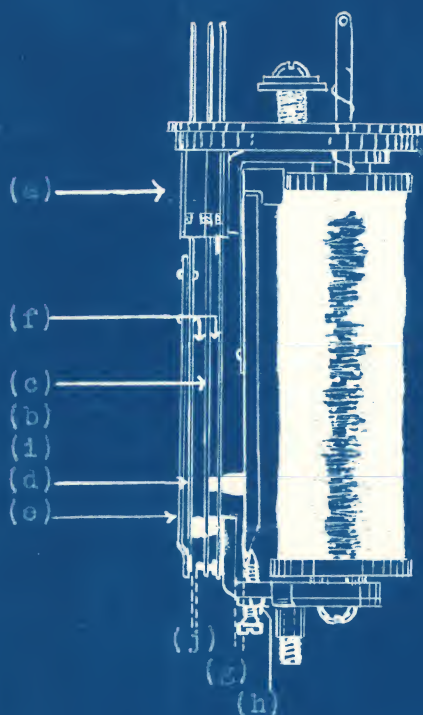
Helical spring tension  
(fig.3c) 2.16  
Operate and non operate 2.15  
Helical spring adjusting stud 2.17  
Down drive core gap 2.18  
Clearance between front stop  
and armature 2.19

Gap between adjusting screw and  
roller arm, magnet fully operat  
ed (fig.3B) (use #80B) 2.20  
Operate and non operate 2.21  
Pawl clearance 2.22  
Pawl engagement 2.23

D.P.S.

THE PACIFIC TEL. and TEL. CO. SEATTLE PLANT 3CH	DWG NO. 189	
	DRAFTSMAN	A.R.F. 12-17-41
	CHECKED	D.V.
	APPROVED	
Adjustment of helical spring type clutches Per BSP A448.002 Issue 20 Added 11 20		



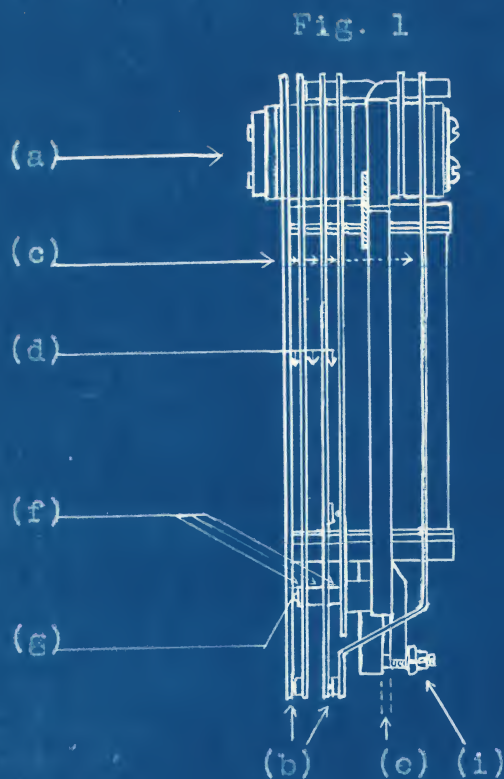


Check relay mounting	2.02
Check tightness of spring assembly (a)	2.06
Contact alignment	2.07
Armature stud clearance (b)	2.08
Traveling spring position (c)	2.09
Stop spring position (d)	2.10
Flexible contact spring position (e)	2.11
Straightness of springs	2.12
Separation between springs (f)	2.13
Armature alignment	2.15
Armature travel (g)	2.16
Tightness of lock nut (h)	2.14
Contact pressure	2.17
Stud gap (i)	2.18
Contact separation (j)	2.19
Contact follow	2.20
Spring sequence	2.21
Electrical requirements	2.22
Timing requirements	2.23
Cover fit	2.04
Tightness of cover nut	2.03

D.P.S

THE PACIFIC TEL. and TEL. CO. SANITARY PLANT SCHOOL	DWG NO.	190
	DRAFTSMAN	ARE 1-2-42
	CHECKED	DV
	APPROVED	
Adjustments to 178 type relays Per BSP 4460.014 Issue 3B		



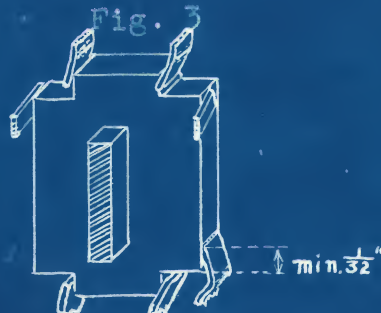


Relay securely fastened	2.02
Spring assembly tightly fastened, fig. 1a	2.05
Contacts properly aligned fig. 1b, fig. 2	2.08
Springs free from kinks fig. 1c	2.16
Springs not touching between pileup and contact end fig. 1d	2.17
Adjusting nut tightness f.11	2.12
Armature travel (per circuit requirement) fig. 1e	2.15
Stud clearance, fig. 1f	2.09
Spring tang position, fig. 3	2.10
Stud gap, fig. 1g	2.19
Contact separation, fig. 2a	2.20
Electrical requirements	

Fig. 2



Fig. 3



THE PACIFIC TEL.  
and TEL. CO.  
SEATTLE PLANT SCH.

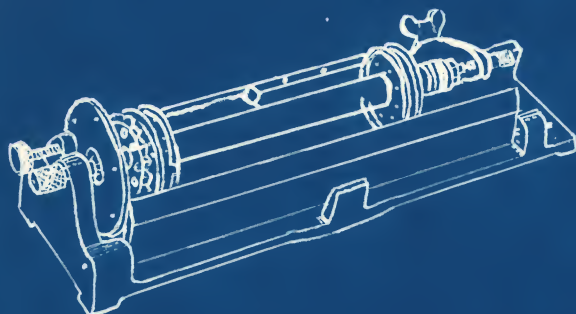
E, F, H, R, & T  
type relay  
adjustments  
Per BSP A461.004  
issue 4D

D.P.S.

DWG No. 191	
DRAFTSMAN	A.R.F. 12-17-41
CHECKED BY	D.V. 12-22-41
APPROVED	D.V.



**PRESCRIBED METHOD FOR ALIGNMENT OF CAMS**  
(Not covered under B.S.M.P.)



Place sequence switch in #245 cam alignment fixture.  
Mark cam nearest index wheel in pos. 5 $\frac{1}{2}$ .  
Remove index wheel.  
Insert knitting needle through holes on cams.  
Replace hexagon nut, tighten only sufficiently to hold cams in place.  
Starting with cam nearest to disc, align all cams in same position over entire length of switch by means of straight edge on fixture.  
Be careful to steady cams with extended fingers.  
Revolve switch throughout all positions, aligning all cam cuttings which are in same position.

When alignment is completed scribe all cams in pos. 5 $\frac{1}{2}$  with #240 scriber.  
Remove needle.  
Replace index wheel; tighten nut, after checking alignment of scribe marks.  
Observe that individual cams do not have excessive wobble.  
To remove wobble: tap separators with #236 tool.  
Replace switch in frame.

**ADJUSTMENTS COVERED UNDER B.S.M.P.**  
#470.003

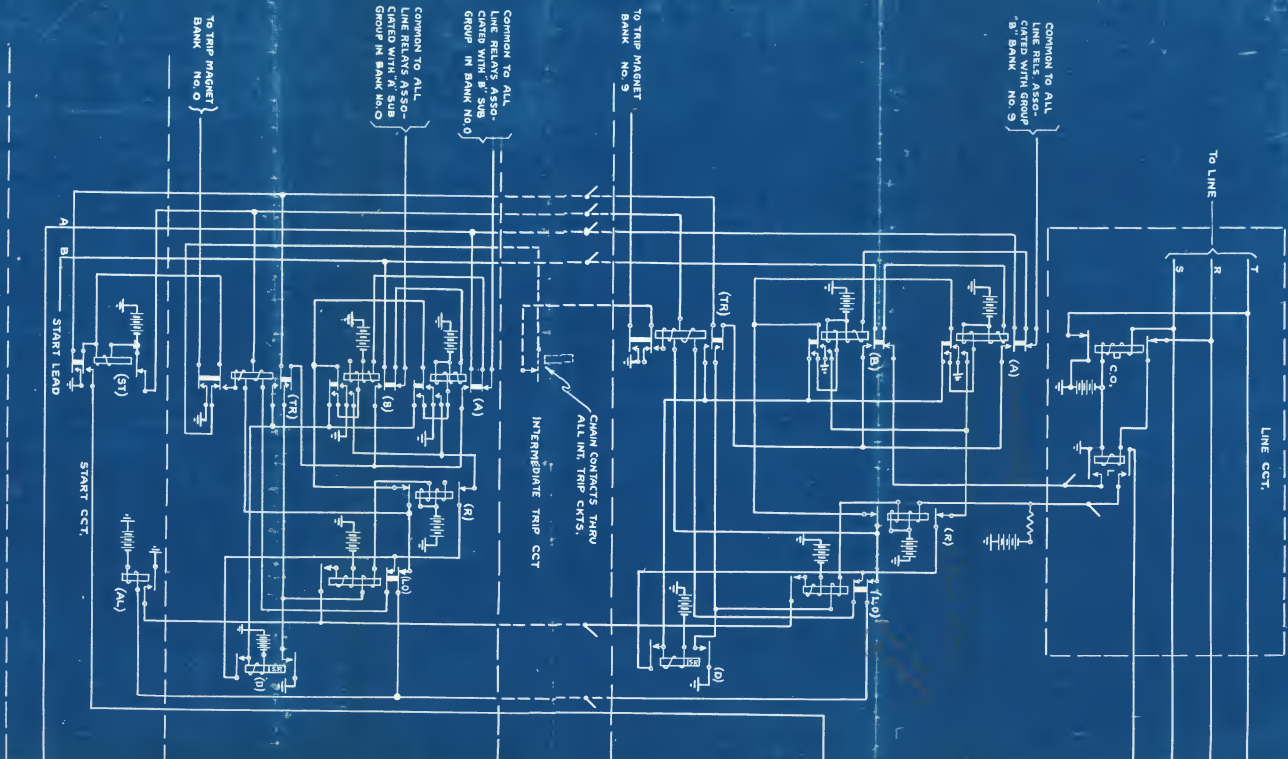
End play of cam shaft (use #56D gauge)	2.05
Pointer adjustment	2.06
Clearance between adjacent contact springs and between springs and framework	2.15
Clearances between the inner surface of the contact springs and the metal parts of the cams	2.16
Vertical location of contact springs	2.17
"A" spring clearance	2.18
Centering of contacts on cams	2.19
Contact spring pressure	2.13
Gap between driven disc and sequence switch frame	2.07
Gap between driving and driven discs	2.08
Vertical location of driving disc with respect to driven disc	2.09
Gap between driving disc and pole piece	2.10
Drive pull	2.11
"A" cam roller pressure	2.12

D.P.S.

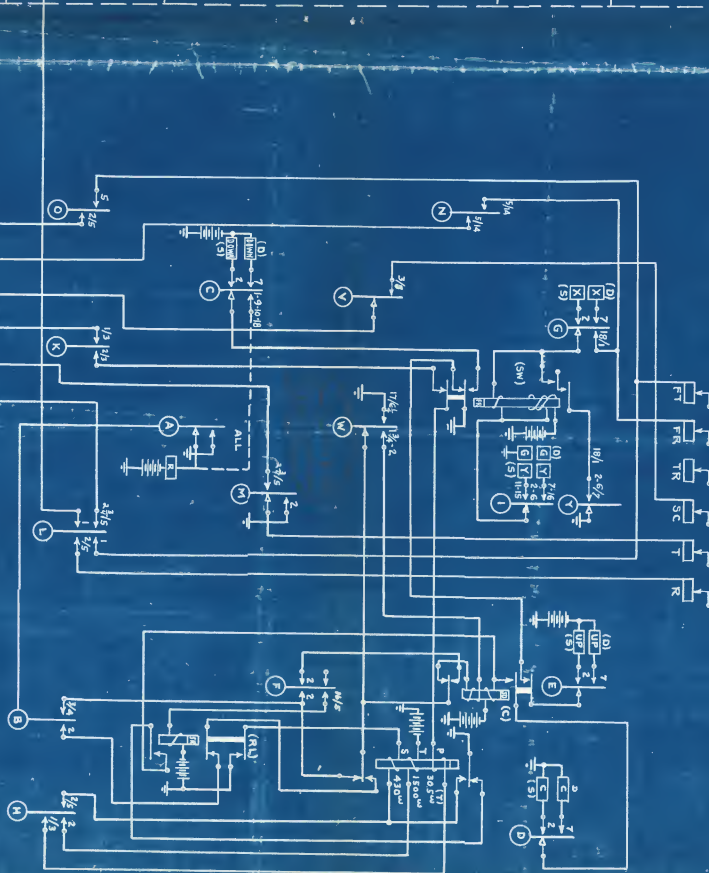
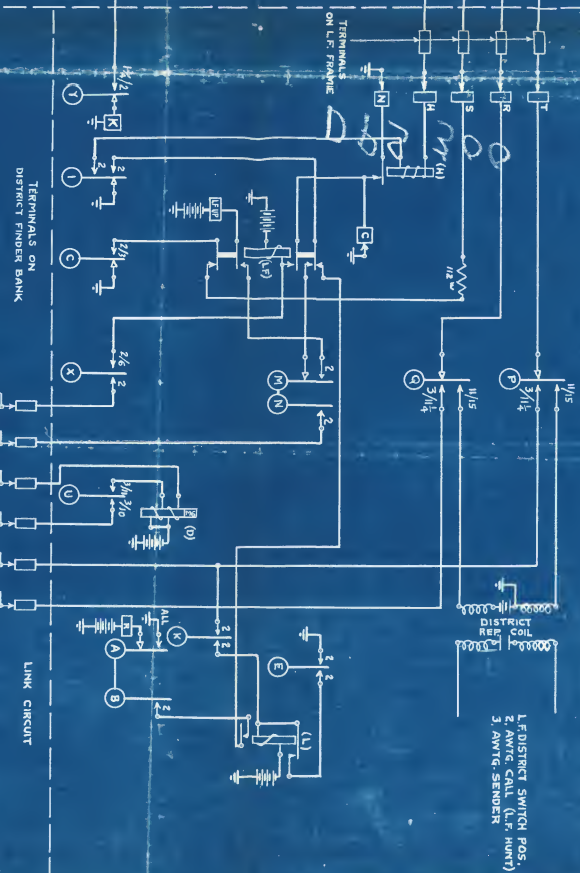
THE PACIFIC TEL. and TEL. CO. SEATTLE PLANT SCHOOL	DWG NO.	<b>192</b>
	DRAFTSMAN	ARF <small>(2-30-41)</small>
	CHECKED	DY
	APPROVED	
Adjustments to Sequence Switches For B.S.P. #470.003 issuc 3D addendum 4D		



# BANK PREFERENCE LOCKOUT TRIP & START CIRCUIT

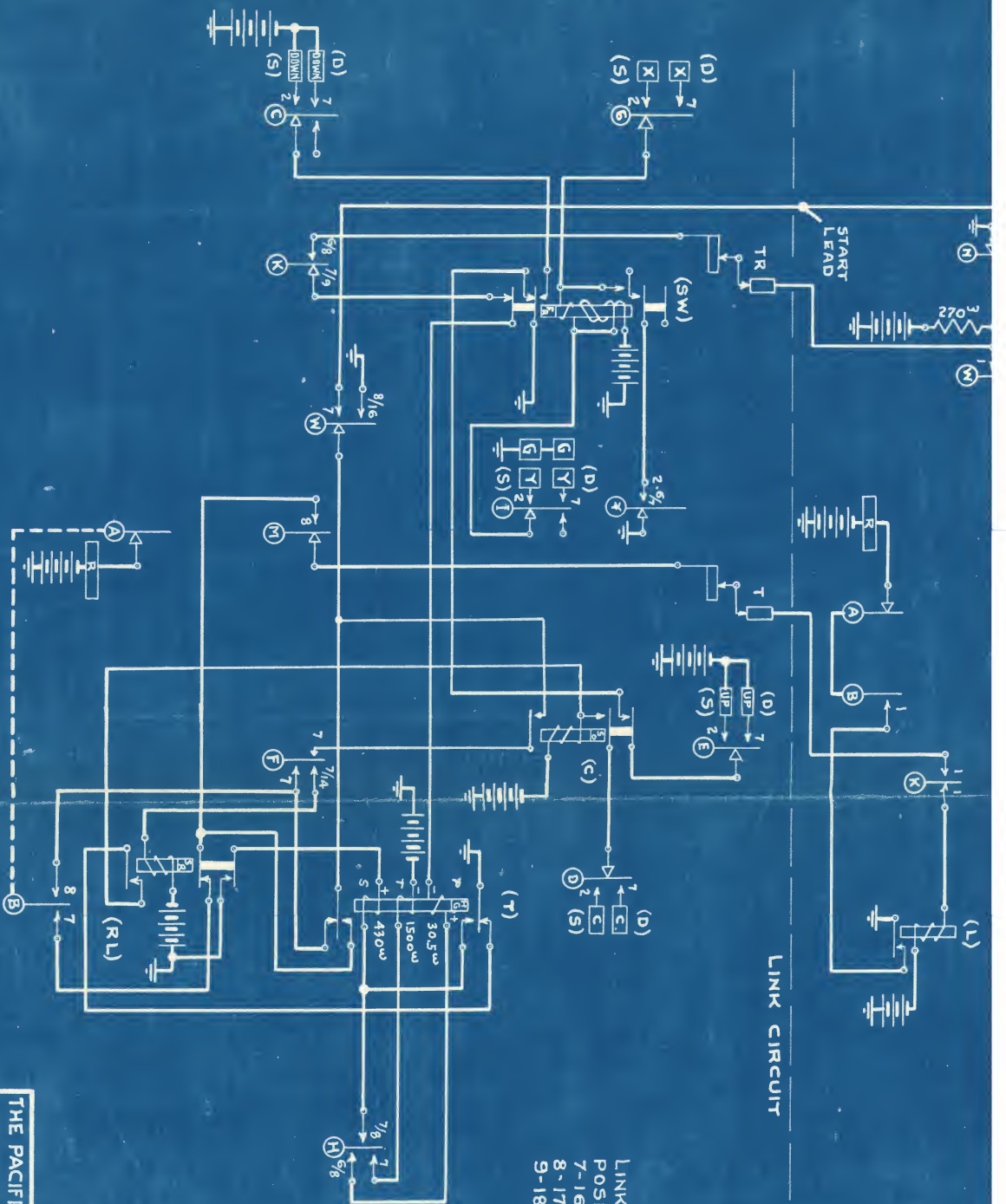


# LINE FINDER AND DISTRICT SELECTOR CIRCUIT



THE PACIFIC TEL. & TEL. CO.  
SEATTLE PLANT SCHOOL  
BANK PREFERENCE  
TRIP START, LINE FINDER  
CIRCUIT  
DRAWN BY: J. H. B. 30  
CHECKED BY: J. H. B. 30  
DATE: 10-1-30

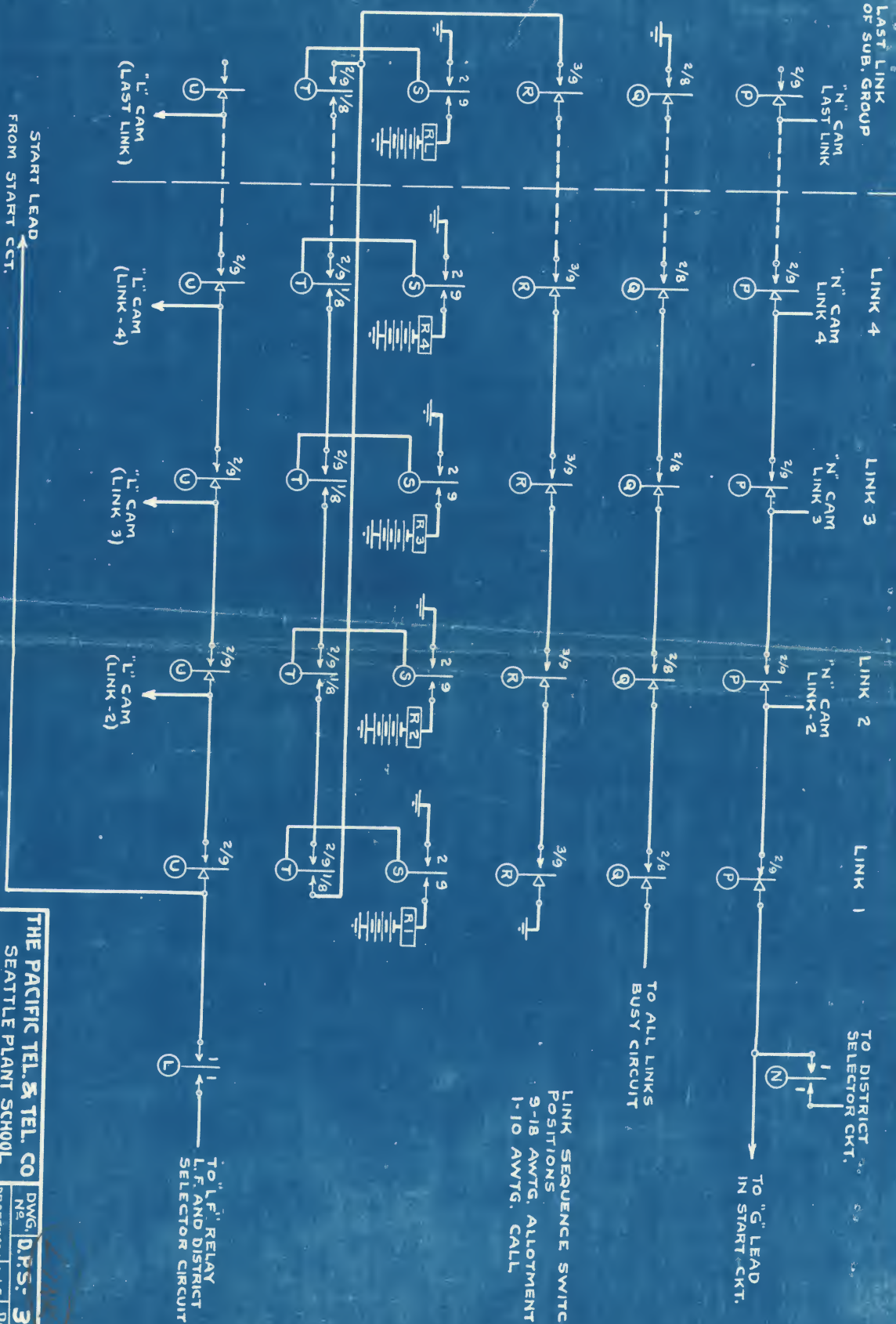




LINK SEQUENCE SWITCH  
POSITIONS  
7-16 HUNT. DISTRICT  
8-17 AWTG. DISTRICT  
9-18 AWTG. ALLOTMENT

THE PACIFIC TEL. & TEL. CO. SEATTLE PLANT SCHOOL		DWG. No. <b>D.P.S. 301</b>	
DIAL TRAINING FUNDAMENTAL OPERATION OF LINK CIRCUIT DISTRICT FINDING		CHECKED BY <i>AM</i>	DATE 10-10-30
		APPROVED <i>AM</i>	ISSUE No. 1
		APPROVED	





LINK SEQUENCE SWITCH  
POSITIONS  
9-18 AMTG. ALLOTMENT  
1-10 AMTG. CALL

THE PACIFIC TEL. & TEL. CO. SEATTLE PLANT SCHOOL		DWG. NO. <b>D.P.S.-302</b>
DIAL TRAINING FUNDAMENTAL ALLOTMENT OF LINKS SUBSCRIBERS LINK CIRCUIT		DATE 10-11-30
CHECKED BY <i>ACM</i>	ISSUE NO. 1	
APPROVED <i>ACM</i>		

TRIP CIRCUIT

START CIRCUIT

LINK CIRCUITS

GROUP "A"

START LEAD "A"



C.A.

TO LINK MOTOR  
STOP ALARM C.T.



START "A"

START "B"

C.B.

START LEAD "B"



TO LINK MOTOR  
STOP ALARM C.T.

(OF)

REG.



GROUP "B"

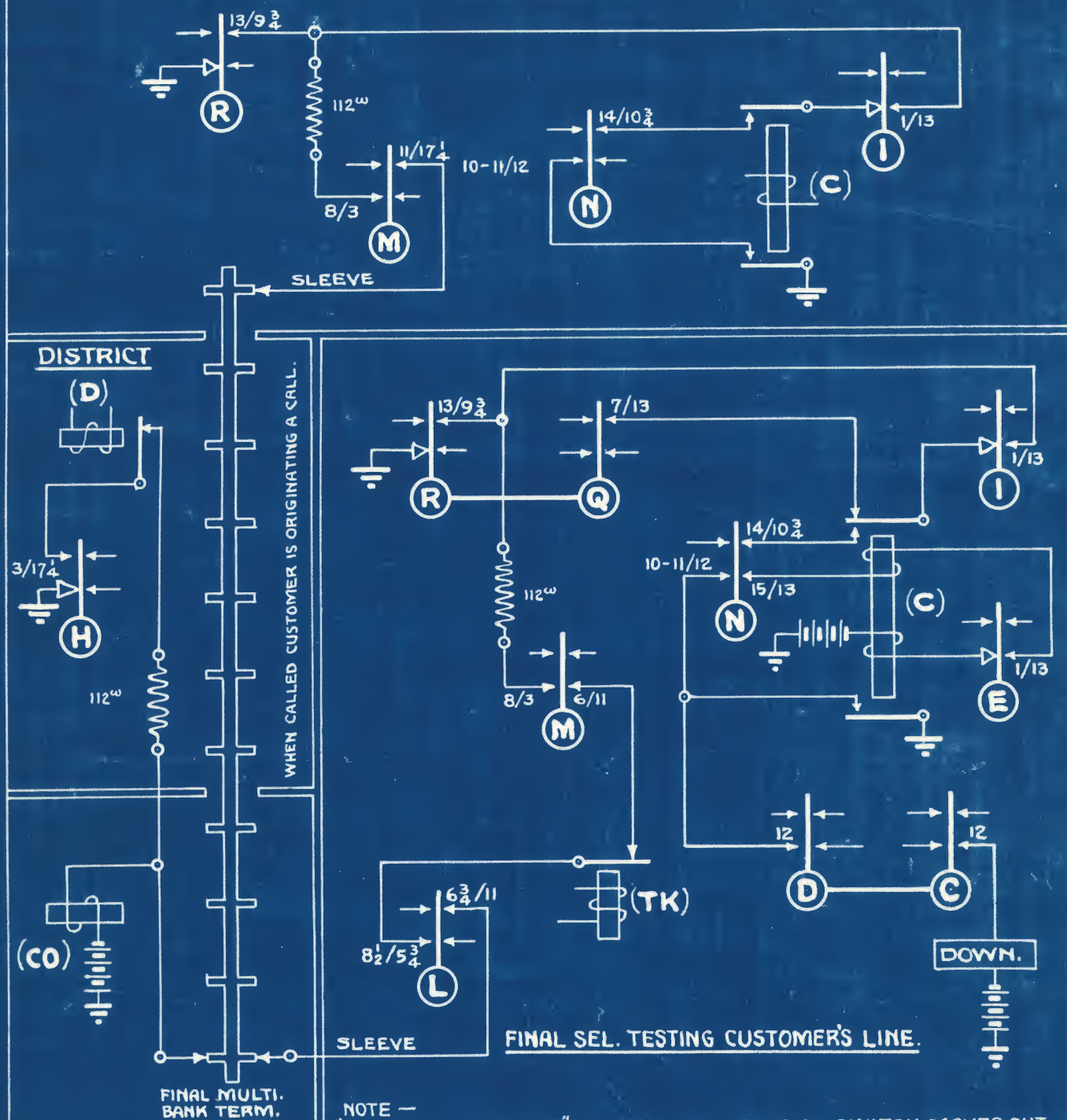
THE PACIFIC TEL. & TEL. CO.  
SEATTLE PLANT SCHOOL

DIAL TRAINING  
FUNDAMENTAL OPERATION  
OF START CIRCUIT  
TRANSFER FEATURE

DWG. NO.	DP5. 303	DATE	10-10-30
DRAFTSMAN	A.J.S.	CHECKED BY	A.G.M.
APPROVED	<i>[Signature]</i>	ISSUE NO.	1
APPROVED			



# BUSY FINAL



NOTE —  
"INDIVIDUAL LINE IDLE" — C RELAY RELEASES AS SWITCH MOVES OUT OF POSITION-10.

"INDIVIDUAL LINE BUSY" — C RELAY LOCKS TO SLEEVE OF BUSY FINAL OR TO LINE FINDER DISTRICT H CAM GROUND, DEPENDING WHETHER CUSTOMER IS BEING CALLED OR ORIGINATING A CALL.

THE PACIFIC TEL. & TEL. CO.  
SEATTLE PLANT SCHOOL

DWG. NO. **D.P.S. 304**

DRAFTSMAN CES OCT.30.30

CHECKED BY R.G.M.

APPROVED BY ISSUE - No. 1

**FINAL SELECTOR  
TESTING  
INDIVIDUAL LINE.**

*adm.*



(S) RELAY VALUES  
 OPR. .0141 AMP.  
 NON. OPR. .0114 "

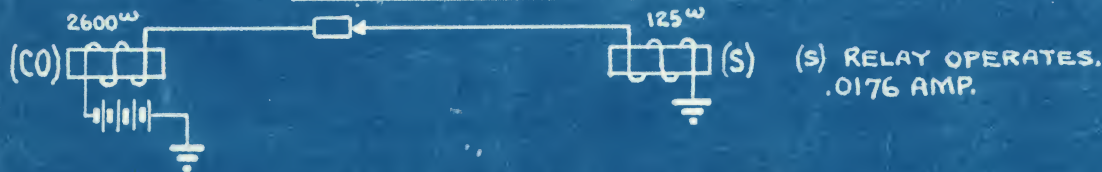
### INDIVIDUAL LINE IDLE



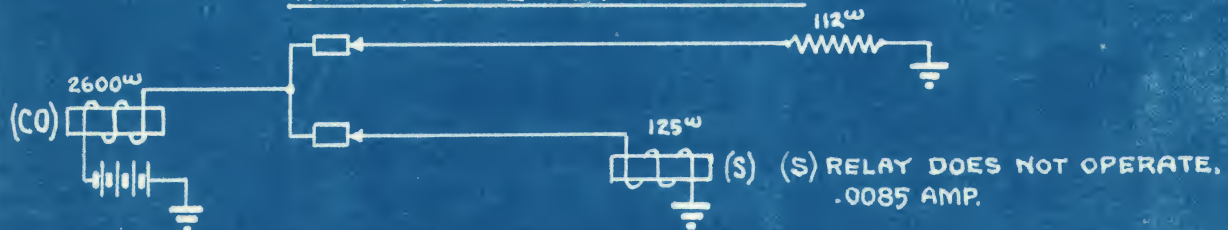
### INDIVIDUAL LINE BUSY



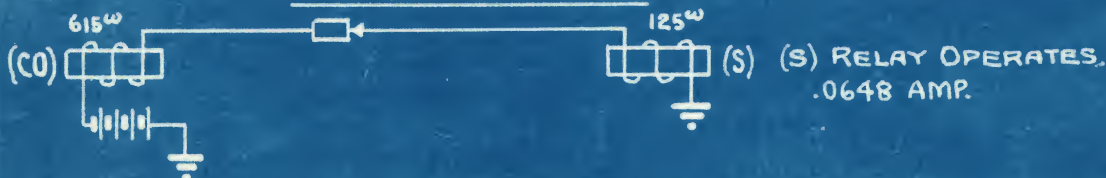
### INTERMEDIATE P.B.X LINE IDLE



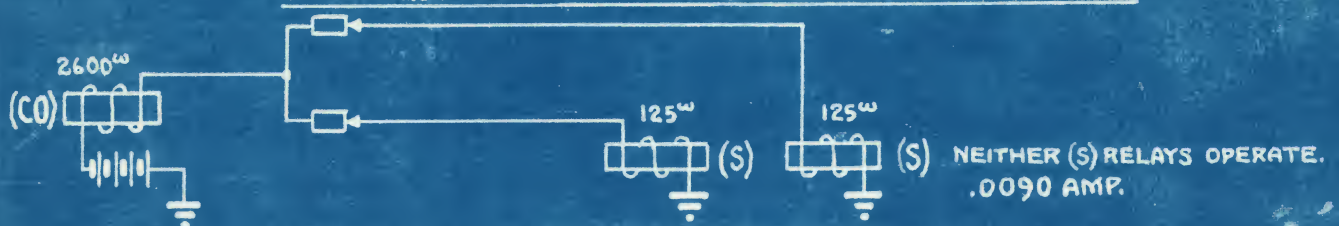
### INTERMEDIATE P.B.X LINE BUSY



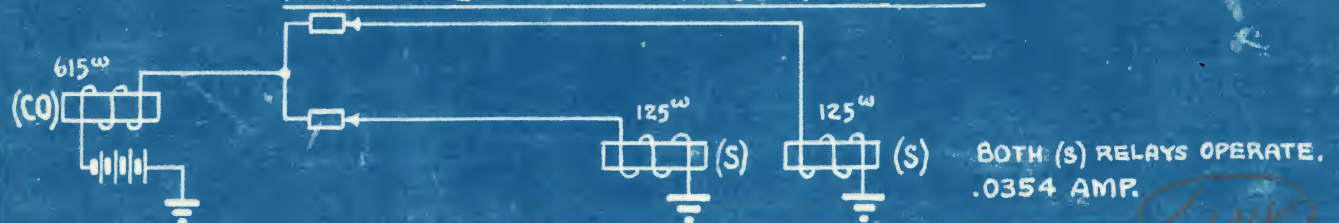
### LAST LINE P.B.X IDLE



### INTERMEDIATE P.B.X LINE SIMULTANEOUS CONNECTION



### INDIVIDUAL LINE SIMULTANEOUS CONNECTION.



THE PACIFIC TEL. & TEL. CO.  
 SEATTLE PLANT SCHOOL.

SLEEVE TESTING  
 FEATURES.

DWG. NO.	D.P.S.- 305	
DRAFTSMAN	C.E.S	10-23-30
CHECKED BY	A.G.M	
APPROVED BY	ISSUE - NO. 1 " - NO. 2	

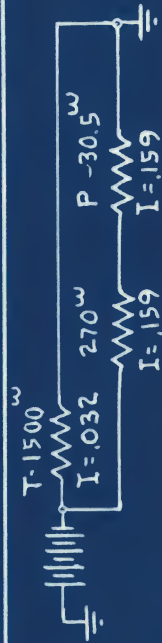




BEFORE T-OPERATES



3 RELAY-T-OPERATED



1 LEAD-TR-CLOSED

4 DOUBLE-T-CONNECTION

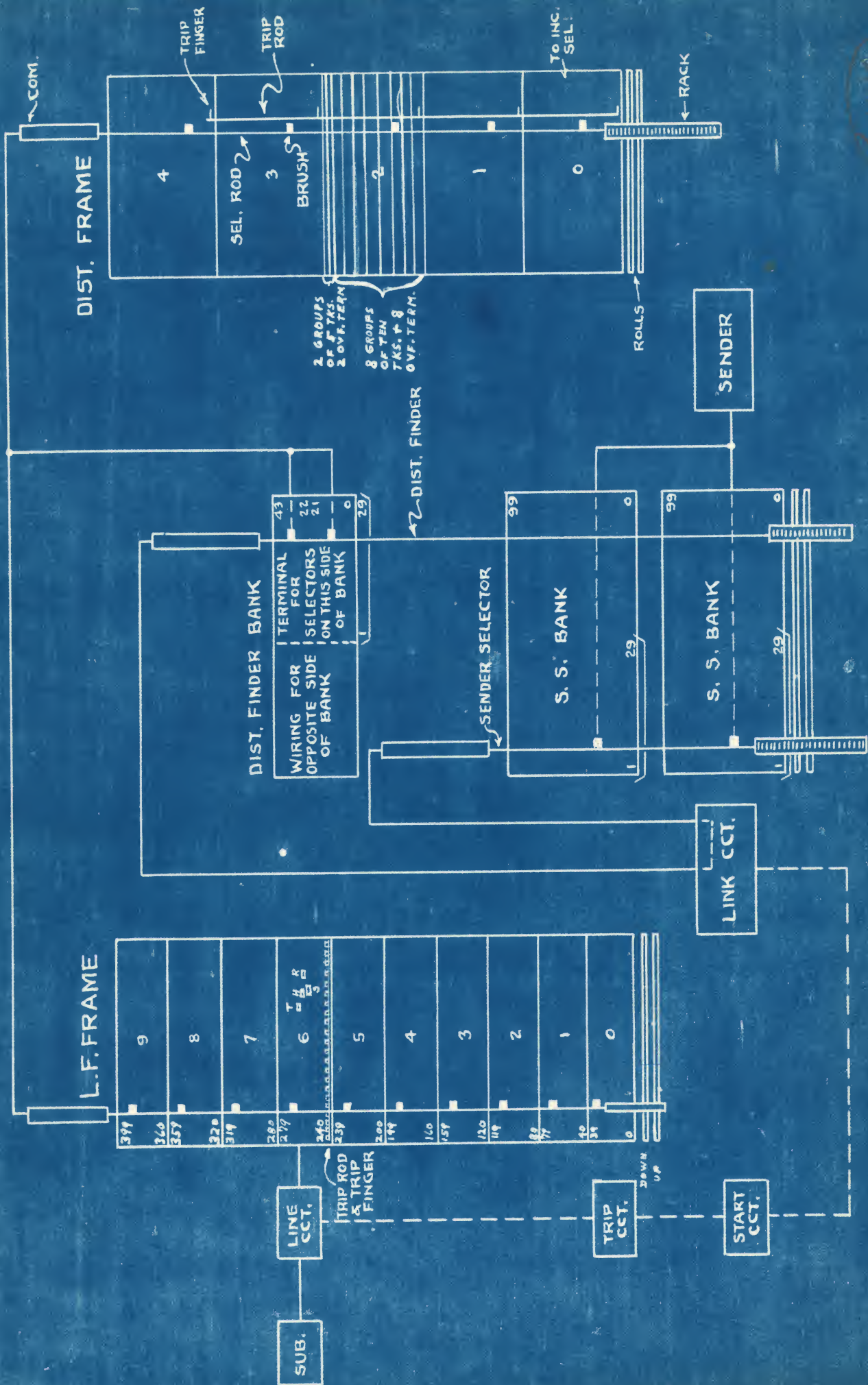


CHART No 2  
SEATTLE PLANT SCHOOL

FRONT OF LINK FRAME

DPS 313

6



Ccts. WITH TYPE  
D-157107 SEQ. SWS.  
1/74 13/5-12/13-17 1/18

NOTE: ON D-157107  
SWS. B.I.S MADE  
IN Pos. 1/9-14

- 1 NORMAL
- 2 BRUSH SEL.
- 3 AWTG. SEN.
- 4 TENS SEL.
- 5 AWTG. SEN.
- 6 UNITS SEL.
- 7 NO TEST, PASS BY.
- 8 AWT. L RELAY.
- 9 PBX HUNTING.
- 10 OPR. PBX RELAY, P
- 11
- 12 AWT. TK RELAY.

NOTE: 1

TK locks up in pos 2 to 9

**FINAL**  
SELECTOR CIRCUIT  
SCHEMATIC - T-502167

